

**Flooding as a Form of Risk:**  
**An Examination of Knowledge in Practice**

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**Thesis submitted to Cardiff University for the degree of Doctor of Philosophy**

**September 2007**

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## Abstract

The thesis examines the contemporary conception of the socio-environmental issue of flooding in England and Wales. The focus is on the policy and expert spheres and the current understanding of the issue as it is represented in these discursive domains. This qualitative research involved three distinct methods; semi-structured interviews, document analysis and observation. The interviews were carried out with key figures that worked in differing roles in organisations and institutions involved in tackling flooding. At one level the assertions in the thesis concern the connections being made between flooding and climate change and the implications of this for approaches to tackling floods. At another level they relate to the emergence of a pervasive risk discourse in relation to flooding. Theoretical ideas from time (Adam 1997; 1998; 2004) and risk theory (Beck 1992a; 1994; 1996; 2000; Luhmann 1993) are utilised to provide a conceptual analysis of the nascent discourses of climate change and risk, through which flooding is understood as a contemporary problem. In this thesis the conceptual and empirical analyses are brought together in establishing questions relating to the emergence of a prevalent risk discourse and what this means for approaches to flooding in contemporary England and Wales. The analysis has produced a picture of a complex and paradoxical context in which efforts are made to address flooding. The thesis offers insights into the difficulties in finding ways of establishing practices appropriate to the knowledge(s) through which flooding is understood as a contemporary problem. The research creates deeper understanding of the issues associated with tackling flooding in contemporary England and Wales and opens up spaces for the kind of reflection that is important for pursuing and enabling change.

## Acknowledgments

My thanks go first and foremost to my supervisor Barbara Adam for her continual guidance, and for the intellectual inspiration she has provided me with throughout my PhD studies. Thank you for always giving me the encouragement I needed to continue through to the end, for introducing to me a stimulating academic environment, for the discussions about the work, for your comments on the draft and for all of the invaluable advice you have given me. Thanks to my second supervisor Ian Welsh who has always been there whenever I have needed him. Thank you most importantly for your comments on the draft. Thanks must go to the Economic and Social Research Council for providing the financial support for this work and to Cardiff University School of Social Sciences, which has proved to be a lively and stimulating academic environment in which to work. Thanks also go to Nick Pidgeon for his support during this past year, to the Leverhulme trust and to those I work with. Special thanks must go to my boyfriend Ian for his sustained help throughout and for making the final weeks that much easier for me. Thank you to my family for all of your phone calls and words of wisdom which have helped me maintain perspective in these final weeks. Thanks go to my dearest friend Alex Hillman without whom these past years would not have been the same. Thank you for all the late night chats, cups of tea and empathy that have helped me through.

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### **Flood**

When all's said, and done,  
if civilisation drowns  
the last colour to go  
will be gold -  
the light on a glass,  
the prow of a gondola,  
the name on a rosewood piano  
as silence engulfs it.

And first to return  
to a waterlogged world,  
the rivers slipping out to sea,  
the cities steaming,  
will be gold,  
one dip from Bellini's brush,  
feathers of angels, Cinquecento nativities,  
and all that follows.

(Gillian Clarke 2006)



## Chapter One

### Introduction

As I write the past few months have seen serious flooding across parts of England and Wales. Significant parts of the country have been devastated by flooding and efforts at recovery are still ongoing. The discussion in this thesis pertains to the societal reaction to the flooding in 1998 and 2000 when parts of England and Wales experienced equally destructive floods. The more recent floods are currently the subject of a review headed by Sir Michael Pitt to examine the lessons that can be learnt from the floods in June and July (DEFRA 2007a). The terms of reference for this review reflect and reinforce the assertions relating to the contemporary conception of flooding delineated in this thesis. The analysis thus remains pertinent today against the backdrop of the recent floods.

The research aims to examine 1) the contemporary understanding of flooding as a socio-environmental issue 2) the policy responses and 3) the challenges in implementing the proposed shifts in approach. Important in this were theoretical questions pertaining to the significance of time and risk theory in advancing understanding of the empirical insights. Six questions were formulated as a jumping off point for the study:

- Why does development continue in high risk areas?
- What is the role of the multiple and conflicting interests of relevant actors involved in decision-making processes i.e. environment agency; planning committees, developers, insurance industry, local councils, central government, individual householders?
- What is role of uncertainty in the negotiations and decision-making processes?
- To what extent is time a key factor in considerations associated with the socio-environmental issue of flooding?

- To what extent is the implicit knowledge concerning the detrimental effects of human disruption of the natural environment translated into action and what are the factors that may militate against this?

These initial questions were interrogated and developed as the study proceeded and are addressed at various points in the thesis. For example, the notion of human disruption of the natural environment was found to be heavily implicated in the contemporary understanding of the issue which is delineated in chapter one. The proposed changes in policy approach, given the contemporary framing of the issue, are examined in chapter two. This analysis provided a basis for examination of the challenges to implementing the proposed policy changes in a context where human disruption of the natural environment (amongst other factors) is considered as a contributory factor in heightening flood risk (see chapters six and seven). The findings that provided insights relevant to this question also contribute to understanding the continuation of development in high risk areas and the significance of uncertainty in relation to decision making (see chapter six).

The conflicting interests of differing institutions and actors are also formulated as engendering difficulties in enacting change. These are discussed in chapter six in terms of both conflicting interests and 'definitional struggles' (Miller 1999) regarding the formulation of flooding as a social problem (i.e. the extent to which climate change is significant in flood risk management is subject to contestation at local levels despite the appearance of policy consensus). Sociological time and risk theory are utilised throughout the thesis for the insights that these theoretical contributions provide in understanding both the difficulties apparent in tackling flooding in the contemporary context and the policy response. As the research agenda developed, the theoretical and empirical observations intertwined to heighten the significance of particular findings and raise further questions. Such questions pertained to the importance (and appropriateness) of risk calculation for acting in the face of uncertainty. The research thus addresses the initial questions posed but also tells a wider story answering questions that arose through the research process.

The PhD study has been conducted over a four period beginning in 2003, although initial interest was sparked in 2000 when serious flooding events occurred across the

country. These floods were the second set of major floods to occur in two years and as such the conception of floods as rare or 'freak' incidents was unsettled. This observation formed the starting point for analysis of the discourses through which flooding is seen to be given a social form. Differing kinds of flooding, such as river, coastal and estuarial, and groundwater, are all considered in this thesis in as far as the participants discuss them. Flooding is thus discussed in general terms although, these distinctions between different types of event are acknowledged. The focus of the thesis is not so much flooding *per se* as it is the discourses through which flooding is formulated as a socio-environmental issue. The discourses of interest are those which originate within institutions and organisations with a role in addressing flooding. Significant bodies linked to flood management in England and Wales were identified as a basis for the investigation (see diagram 1 on the adjacent page for an indicative map of the institutions/organisations included in the sample). The sampling procedures and links between institutions are discussed in greater detail in chapter two.

The research has involved a combination of methods to achieve insight into the areas of interest. Interviews with key actors that have a role in relation to flooding were an important source of data for this study (see diagram 1 for the institutional affiliations of interviewees). Document analysis was significant in achieving a deeper level of understanding with regard to the discourse and in developing a wider knowledge of the topic. Observation formed the final method and was invaluable in providing a broader contextual backdrop to the data obtained from the interviews and document analysis. These three sources of data are utilised in conjunction with one another in the thesis to achieve understanding of the issues.

A constructivist position, whereby the social world is conceived as continually constructed and produced through the placing of subjective meanings, underpins the research. The notions of discourse and framing from within sociology are utilised as conceptual tools for discussing the issues. These notions refer to means by which people subjectively interpret the world and, as such, are useful in discussing the data in a way that is congruent with the ontological position. A qualitative approach to methodology has been adopted for facilitating access to the kinds of subjective



## Policy-Political

Treasury \*

Department for  
Environment, Food and  
Rural Affairs (Defra)  
\*

Operating Authorities

Local  
Councils

Environment  
Agency (EA) \*\*\*\*\*

Internal  
Drainage Boards

Office of the Deputy Prime  
Minister / Communities and  
Local Government  
\*

Planning Policy Teams in  
Local Government  
\*

Welsh Assembly  
Government WAG

Local Government Association  
Welsh Local Gov. Association  
Improvement and Development Agency  
IDeA

## Scientific/Academic

*Natural  
Scientific  
Research  
bodies*

*Other (e.g.  
Engineering-  
g-Social  
Sci.)*

Tyndall  
Centre for  
Climate  
Change  
Research \*

Flood  
Hazard  
Research  
Centre  
FHRC \*\*

United  
Kingdom  
Climate  
Impacts  
Programme  
UKCIP \*

Benfield  
Hazard  
Research  
Centre \*

Hadley Centre

EA funded University Flood  
Research Institute \*

Flood Risk Management Research  
Consortium FRMRC \*\*\*

## Independent (e.g. NGOs)

World Wild Fund

Green Peace

National Flood  
Forum NFF  
\*

Natural England

Country Land and  
Business  
Association

Institute of Civil  
Engineers \*\*\*\*\*

Sustainable  
Development  
Commission  
(Independent  
organisation  
funded by Gov. to  
provide advice on  
sustainability)

## Industry

*Engineering  
Consultancy  
and Developers*

E.g. Halcrow, HR  
Wallingford \*\*\*\*\*

E.g. Taylor  
Wimpey UK Ltd. \*

*Insurance*

Association of  
British Insurers \*

Zurich – Insurance  
based financial  
services provider \*

Insurance  
consultancy \*

The focus in this thesis is upon discourse in institutions and bodies linked to flood management in England and Wales. As such, this diagram provides an outline of the main institutions identified as having links with flood management for the purposes of this study. The organisations are divided according to categories devised for analysis outlined on pages 68-69. These were necessary for the purposes of anonymity. The red stars indicate the (primary) institutional affiliations of the interview participants. Black stars are utilised to indicate where participants held roles in relation to more than one institution (i.e. black stars refer to secondary roles for the purposes of the thesis). In cases where the data utilised made reference to their knowledge of differing organisations they had previously had roles within these are also indicated with black stars.

## Caption for Diagram 1: Notes on the Roles of Bodies with links to Flood Management

Policy-Political (including institutions or bodies which have some direct link with political sphere)

Defra has the primary policy role in relation to flood management however policy development is shared with the Environment Agency. Defra allocates funding for flood management activities to the operating authorities identified in the boxes below Defra (i.e. environment agency, internal drainage boards and local councils). The environment agency receives by far the highest percentage of Defra funding and is identified here as holding a highly significant role in relation to flood risk management, although it should be noted that its powers in relation to planning are limited to providing guidance and placing objections<sup>1</sup>. ODPM/CLG has responsibility for planning policy and delivers the policy planning statements. Local councils (planning departments) approve or deny planning applications. Internal drainage boards are independent bodies with responsibility for land drainage and non main rivers- the EA is responsible for main rivers). They are classified in this category for the purposes of the diagram because they are one of the operating authorities responsible for aspects of flood management however, they are independent bodies and would have been labelled as such in the text were any participants primarily affiliated with an internal drainage board. WAG has particular devolved powers for Wales in areas such as planning. However, there are strong similarities between England and Wales in policy direction and approach e.g. the local development framework (2004) is to be applied across England and Wales. Bodies like the IDeA, the Welsh local Gov. Association and Local Gov. Association promote better local Government and represent the interests of local Gov.

Scientific/Academic (including natural scientists, engineers based in academic institutions and social scientists)

Academic institutions work with the policy sphere in some instances (e.g. the FHRC has been responsible for much of the economic calculation in relation to flood risk calculation; in addition, research into flood risk modelling, for example, may be carried out in academic institutions). The Tyndall Centre and UKCIP have roles in climate science but with a focus on adaptation issues, such as flood risk, and provide advice on these issues in relation to climate change. The FRMRC was a body set up to facilitate development of the Defra/EA research themes across institutions.

Independent Organisation (including NGOs)

NGO's have influence on policy and are active in various debates and research related to flood management e.g. habitat loss and negative environmental impacts through disruption of natural systems. The NFF is a charity set up by people that have experienced flooding to provide support, knowledge and help to those affected by floods. They also work with other organisations, like Defra and the EA and lobby Government for flood alleviation.

Industry (including consultants, engineers and insurance)

Engineering consultancy firms (I provide examples of such firms in the diagram) provide the expertise required for the design, construction and implementation of flood management schemes for the EA, developers (e.g. Taylor Wimpey UK Ltd.) and individuals investing in flood management. They are active in devising site specific flood risk assessments as part of environmental impact assessments. Engineers with long careers in flood risk management have first hand experience of implementing flood management schemes, and working with other bodies involved in the processes (e.g. local councils, Defra, EA, ABI, developers). The ABI is the trade association for Britain's insurance industry. Its nearly 400 member companies provide over 94% of the insurance business in the UK (ABI 2007a). Major insurance providers were sampled for more specific insight into insurance company procedures with regard to flood risk, with an interview participant selected from one of these insurance companies. Consultancy for insurance companies entails advising the insurance sector, in this case on climate change and flood risk impacts.

<sup>1</sup> In 2003 over 600 new building projects, mainly residential, were given planning permission against the advice of the Environment Agency (Crichton 2005)

interpretations and constructions viewed as important for understanding the social world.

This thesis is data led and the issues discussed herein are viewed as having been established through processes of co-construction in which the interlocutors have been active participants. Their understanding of the problem and reflections on the issues have been drawn together with this researchers own interpretations to create the story that is told. The thesis provides a picture of the complexities associated with understanding and tackling flooding in contemporary England and Wales. This is achieved through an assimilation of sociological theory and data. When the theoretical literature and the data are viewed together interesting questions become visible. When seen in conjunction the conceptual and practical implications of the contemporary conception of flooding allow insights which would otherwise be hidden from view.

The narratives in the data have been analysed from a timescape perspective (Adam 1998), allowing the differing temporalities at play and their implications for understanding and action to be seen. This way of seeing the data and the social world has been complemented by sociological risk theory, which has been utilised in achieving a view on the conceptual implications of the framings evident in the data. The elements of time and risk theory have been utilised together with the data to create the wider story. Thus, movement between data and theory has been important in establishing the treatise. The complexities in the wider story are drawn together with a thread of argument which is informed by both the conceptual and the empirical aspects of the work. The wider argument is introduced now as a guide through the more complex story that the data and the literature together reveal.

In England and Wales flooding has come to be understood as a socio-environmental issue which has its causes rooted in the industrial way of life. It is no longer construed as solely a natural hazard but as a problem which is caused or at least exacerbated by past and current practices. This is evident in the contemporary contextualisation of flooding in terms of climate change, land use practices and development, as well as the recognised limitations of hard flood defences.

A significant number of scientists assert the likelihood that flooding will worsen (in uncertain ways) as cloud cover and precipitation increase due to climate change (Evans et al 2004a; Hulme et al 2002). This knowledge has come to be incorporated as an important part of the contemporary demarcation of flooding as a social problem. Knowledge relating to the role of land use and flood defence practices in exacerbating flooding has also come to be important in understanding the issue. This informs us that building on areas which act as natural flood defences will increase the likelihood of flooding. In addition, it tells us that flood defence practices have a role in causing flooding in those surrounding areas not protected by the defence.

The role that hard flood defences play as a solution is depicted as limited by the highly developed nature of contemporary society - which means there are likely to be houses wherever the flood waters are redirected to by the flood defence. Paradoxically, such high development makes a shift away from strategies of defence difficult, as there is an imperative to protect. The expectation for increasing development in the future compounds the problem. Hard flood defences must thus either be constructed in such a way as to protect all areas (which is ruled out by the limits of funding) or they are allocated only to some areas and not to others. This thus helps to prevent flooding for some, while exacerbating the problem for others. These knowledge(s) relating to flood defence, climate change, and land use are drawn upon and combined to create an understanding of the problem particular to the contemporary age.

At a point when, and in a context where, flooding is expected to increase in uncertain ways due to climate change, the solution of flood defences comes to be seen as problematic. The knowledge that flooding is likely to increase in potentially unprecedented ways makes the notion of building walls to protect against floods increasingly difficult to uphold as a sustainable solution. The requirements for development, as an important part of capitalist societies – mixed with other competing pressures including environmental – create notions of abandoning flood defence as a solution which is equally difficult to take up. The contemporary framing of flooding in terms of knowledge(s) relating to climate change, land use and development thus creates a difficult context for those working to tackle floods.

In this difficult context a heightened level of ‘risk talk’ and a greater emphasis on risk calculation has become apparent (Power 2004: 9). The notion of risk management and the significance of risk calculation arise as important facets of the discourse relating to policy responses to floods. This is evident in the current flood management strategy, which includes a specific section on the rationale for a risk based approach to flood management and planning (Defra 2005). It is also apparent in the planning policy statement, PPS 25, for flood related planning, which makes reference to the significance of risk approaches for decision-making (Communities and Local Government<sup>1</sup> 2006). Moreover, the recent planning policy statement on climate change advocates a ‘precautionary’ approach to planning where there is a flood risk (Communities and Local Government 2007: 15). This is implemented through the inclusion of ‘precautionary’ estimates for climate change in flood risk assessments (e.g. a 20% increase in flow for fluvial flooding; see chapter nine).

The significance of a risk basis for decision-making in the policy domain finds application in the Environment Agency’s (EA) flood risk maps. The Environment Agency and Defra operate a joint risk research team and flood risk groups for improving and updating the flood risk maps. The Environment Agency has instituted a special risk management unit to give advice on managing flooding on a risk basis (including both probability and consequences). These developments together constitute a clear indication of the importance of a ‘flood risk framing’ in official policy and implementation in planning and managing floods (see chapter five).

Along side the development of the risk basis for decision-making, proposed solutions to flooding arise as involving changes to present practices. These represent significant shifts in contemporary ways of doing to align practices with the nascent understanding of flooding. The analysis of the data indicates that there are barriers to enacting such changes. Adam’s (1998) timescape perspective allows a way of viewing the participant accounts of the difficulties in implementing changes as connected to the contemporary relation to the past, present and future. From this temporal perspective, it is possible to see that the historical trajectory of past development and

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<sup>1</sup> Previously Office of the Deputy Prime Minister

particular ingrained ways of doing and knowing create difficulties in exacting shifts in approach.

Risk methodologies (i.e. risk assessment and cost-benefit analysis) are highlighted in the conceptual literature as entailing particular assumptions. These are seen to act in ways which make difficult the implementation of shifts in practices with regard to flooding. As such, the heightened emphasis on a risk basis for decisions can be seen to create difficulty for, rather than further, the proposed changes in management strategies e.g. towards innovative 'softer' approaches. Issues in exacting change are highlighted in a similar way by the research participants. The conceptual and the empirical elements of the work are analysed in conjunction with one another to reveal difficulties in change.

The participants discussed clashes between drives to enact approaches to flooding congruent with the nascent understanding and development needs associated with capitalist societies. These issues relate to the historical legacy of development and the role that this legacy plays in shaping actions in the present. From the conceptual analysis these issues can be seen as exacerbated by particular assumptions ingrained in present ways of calculating risk costs and benefits. For example, viewed from a temporal perspective these clashes can be seen as in part emerging through contrasts between the short-term vision inherent in economic assessment and the long-term view required to tackle flooding in this new context.

Proposed solutions, such as building in resilience and managed realignment, have not yet been widely implemented (Ledoux, Cornell, O'Riordan, Harvey and Banyard 2004). It is suggested that, in addition to the pressures associated with sustaining capitalist industrial societies, there are barriers to the implementation of innovative approaches embedded within current contemporary practices associated with risk rationality. For this assertion too the data and the theory are utilised together in informing the analysis. Difficulties relating to risk approaches can thus be made evident when the data and the conceptual work are woven together as an integrated whole.



Given the difficulties with risk approaches, it arises as interesting that solutions to flooding are increasingly framed in terms of risk. This thesis seeks to examine the significance of conceptualising flooding as risk for contemporary England and Wales. The questions posed relate to the reasons for the increasing prevalence of 'risk talk' in relation to flooding as the particular contemporary understanding emerges. The question that becomes interesting is; why risk? Why is there an increasing emphasis on risk given the role it plays in limiting change? What is it that is important about risk for contemporary societies? And how can this help us understand the emergence of a more pervasive risk discourse with regard to flooding?

The notion of risk is often taken for granted by many that utilise the terminology. The sociological risk literature and time theory provide insights into the historical emergence and significance of risk for modern and contemporary societies. Risk is opened up as a conceptual category which entails a particular way of seeing. The analysis in this thesis therefore, utilises key works in the social theoretical risk and time literature for its explanatory capacity. These literatures are utilised in understanding the emergence of a pervasive risk discourse in relation to flooding and the significance of this given the contemporary contextualisation of the issue as a climate change impact.

The conceptual work on risk and time provides insight into the importance of risk (and cost-benefit) approaches to decision-making for the contemporary age. A historical analysis of the social significance of risk and the emergence of the 'modern' concept reveal the deep-seated importance of risk rationality for coping with uncertainties and providing a firm basis for decisions and actions. Beck (1992a), Luhmann (1993) and Adam and Groves (2007), amongst other commentators, have noted the significance of risk calculation and rationality for taming uncertainty in relation to the future. The pre-modern future is characterised in terms of pre-destined fate and divine will. The modern<sup>2</sup> future, however, is depicted as increasingly determined by human decisions. This is seen to increase uncertainties and insecurities

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<sup>2</sup> 'Modern' is taken here to refer to the period 'beginning in the seventeenth century and gathering force in the eighteenth century' (Lupton 1999a: 5). The emergence of modernity is seen to have entailed a series of major historical transitions or deeply structured processes of change taking place over long periods (Hall and Gieben 1992; Held 1992). Modernity is defined as 'the institutions and modes of behaviour established first of all in post-feudal Europe, but which in the twentieth century increasingly have become world historic in their impact' (Giddens 1991: 14)

with regard to the future (Luhmann 1993). The emergence of the modern concept of risk is posited as a means for telling the future with greater degrees of certainty, to allow a firm basis for the taking of decisions (Beck 1992a; Luhmann 1993; Adam and Groves 2007). The facility of risk in this respect is relevant to the increasing uncertainties, anxieties, flux and change that many authors have noted as characteristic of the modern era (e.g. Giddens 1990; Beck 1992a; Lash and Urry 1994).

These assertions are utilised in an explanatory capacity to understand the increasing emphasis on risk calculation. The contemporary understanding of flooding as a climate change impact is contended to alter the conception of flooding. It is held to heighten uncertainties, with regard to flooding as actuarial risk calculation becomes difficult to apply in a meaningful way when indeterminacies relating to climate change come in to play. Climate change is delineated as a novel risk not readily amenable to conventional risk calculation. It is posited that the heightened uncertainty in relation to flooding is met with increasingly pervasive and complex risk calculations, noted as important in providing the capacities for decision-making in the face of uncertainties. As noted however, the emphasis on risk calculation for decision-making and thus action makes difficult the enactment of the kinds of changes that the contemporary conception of flooding implicates.

This situation is seen as related to the indeterminate uncertainties associated with knowledge about climate change, and the fundamental nature of the changes required to tackle flooding as a climate change impact. The emphasis upon risk calculation is posited as a way of coping with (indeterminately) uncertain knowledge that if taken seriously requires a significant level of change. It is posited that the difficulty, however, lies not in calculation but in exacting appropriate change in the context of a historical legacy of development and ingrained practices. Better calculation does not by itself enable implementation of the scale and urgency of changes in practices required in light of the contemporary understanding. Instead the emphasis delays action and breeds inertia as the tools for decision-making themselves act to make change difficult.



It should be highlighted that it is not the methodologies themselves or the employment of them for knowledge building that is viewed as problematic. Rather, the underlying difficulty is related to taking action in the context of problems where the causes are identified as practices core to the contemporary way of life and where indeterminate knowledge is involved. Without an emphasis on risk calculation as the means to inform decisions there are only the (very difficult) decisions and questions relating to how to implement change and the scale of change required. Taking these decisions without the security of past knowledge and risk calculation becomes unavoidable in many senses. In the case of flooding the indeterminacies associated with climate change are now integral to understanding of the problem. Without a focus on better knowledge derived from risk calculation, however, there are only questions concerning the extent of capacities for changes in action and ways of doing.

This introductory overview is indicative of the thread of argument that runs through the thesis. The conventions of linear narrative are difficult to adhere to in telling stories of society where complexities dominate. A layering of accounts, described by Goffman (1974) bears resonance with the way the story is told here. It thus may help the reader to have an outline of the chapters to gain an impression of the way the wider story introduced above is unpacked through the thesis.

Chapter two entails discussion of the epistemological position, methodology and the methods employed in the research (Henn, Weinstein and Foard 2006). A constructivist position in relation to the issues is delineated and discussed with reference to wider debates within environmental sociology. The notions of framing and discourse are demarcated as tools for discussing the social world when understood as a subjectively interpreted construction. The qualitative methodology and methods are discussed in relation to the underlying conceptual position and issues associated with knowledge creation and research more generally. In this chapter the particular methodological issues relating to the sample and issues that arose with regard to anonymity are also discussed.

In chapter three the key conceptual works that have informed the analysis and the development of ideas are elaborated. The wider theories of Beck (1992a; 1994; 1996; 2000), Luhmann (1993) and Adam (1997; 1998; 2004) are outlined and discussed

prior to their more selective application in relation to the empirical data. The points of similarity and departure are explicated in this chapter before they are utilised together in the analysis. This chapter thus provides insight into the conceptual ideas underpinning analysis particularly Adam's (1998) timescape perspective, and the works which are drawn on later in the thesis.

In chapter four the contemporary understanding of flooding is mapped according to the discursive representation of the issue. It is asserted that three areas of concern have emerged as important in defining flooding as a problem. The data analysis reveals these elements as relating to a) land use and development practices, b) the difficulties associated with strategies of defence, and c) climate change. The notion is introduced that these three aspects, drawn upon to define flooding, are 'known' in differing ways. The timescape perspective (Adam 1997; 1998; 2004) provides a way of looking that reveals differing capacities for the establishment of causal relations. Climate change entails a temporality involving long time lags between cause and effect making it difficult to establish causality. The issues associated with land use and flood defences are empirically observable and traceable causal relationships can be identified. As such, the relation between climate change and flooding is noted as an aspect of the representation of the problem that is of particular importance in altering the nature of flooding and increasing uncertainties.

The rising prevalence of 'risk talk' and the solutions posed to flooding in this new context form the focus of chapter five. The emergent narrative of risk management and the shift in policy approach which this entails is detailed. The more pervasive emphasis on a risk-basis for decisions is discussed in this context. The differing temporal dimensions of climate change are analysed further and assertions relating to the compatibility between issues like climate change and 'risk strategies' are expounded. The increasing emphasis on risk in relation to flooding as it comes to be designated as a climate change impact is noted as interesting, given the temporal analysis of risk calculation and management as inappropriate conceptual tools for understanding such issues.

Chapters six and seven entail discussions of the barriers to implementing the new policy approaches subsumed under the banner of risk management. Theory and data

are analysed together to provide a picture of the multiple complexities that arise in efforts to enact change. In chapter six the data is examined to reveal the complex and difficult context in which efforts are being made to address flooding in contemporary England and Wales. Contradicting priorities and pressures are revealed as limiting capacities to exact shifts in approach. In chapter seven the reliance on risk calculation and economic cost-benefit analysis in decision-making practices are analysed temporally to reveal the barriers they present for enacting changes in ways of doing.

The final chapter entails a return to theory utilising the major theoretical works of Beck, Luhmann and Adam to shed light on the increasing emphasis on risk given the assertions that reveal risk calculation practices as delaying the pace of change. Reflecting upon the discussion in the previous chapter the conceptual works are utilised in an explanatory role for understanding why risk? and why now? The framing of flooding in terms of climate change, and the new and indeterminate uncertainties that this understanding engenders, are positioned along side assertions regarding the significance of risk for taming uncertainties in decision-making. The increasing emphasis on risk calculation is posited as, in part, related to the heightened insecurities with regard to flooding, created as it comes to be understood in association with climate change.

Themes of enquiry have been derived through the empirical process and analysed for the insights they provide. This discussion is complemented by a wider social theoretical analysis, exploring the potential explanatory power that this offers for understanding the contemporary conception of the problem and the proposed ways of tackling the issues. This thesis does not offer new or different solutions but rather entails a careful delineation of the problems depicted by participants, as well as those made visible from conceptual analysis. In drawing together the empirical and the conceptual elements of the research to shed light on these issues new spaces are opened up in which practitioners might see avenues for change.



## Chapter Two

### Epistemology, Methodology and Methods

Method connotes a manner of viewing and talking about reality as much as it specifies technique and procedure. (Holstein and Gubrium 1999: 121)

#### **Introduction**

The methodological approach to this research project is a qualitative one entailing the triangulation of methods. Interviews, document analysis and observation have all been utilised as techniques for learning about the substantive concern. Henn, Weinstein and Foard (2006) distinguish between methodology and methods. They characterise methodology as entailing 'a wide ranging number of considerations based upon our philosophical perspective as well as practical issues' (Henn et al 2006: 17). As such, in addition to the description of the chosen methods and their related difficulties as they were encountered in this research project, the following discussion entails extrapolation of the epistemological position adopted here. Conceptual and epistemological concerns will also be expanded upon and discussed in the following chapter.

As a basic starting point, the author has tended to favour a view of the data as comprising accounts of subjective experience, rather than the more positivist position which views (good) data as providing (a close to) mirror picture of the reality that exists in the social world. However, the aim here is to achieve a more nuanced position such as that proposed by Miller and Glassner (2004). They posit a conceptual stance situated 'outside the objectivist-constructivist continuum' but which 'takes seriously the goals and critiques of researchers at both its poles' (Miller and Glassner 2004: 126). The extent to which these aims are achievable is to some extent disputable but their discussion does provide some valuable insights which bear resonance with the position here.

This thesis proceeds from the recognition that researchers are part of the social world which they are studying. It is asserted that all research entails and necessitates selective observation and theoretical interpretation of what has been seen. This means that the research and the knowledge produced from such work always involves a level of subjective choice particular to the researcher. This understanding of research as a knowledge producing activity thus requires a reflexivity on the part of the researcher that has been adhered to throughout this study. From these broad indications of the methodological and epistemological approach the more detailed discussion proceeds.

### **Research Beginnings and Epistemological Underpinnings**

The research interest in the topic under consideration here may at first sight seem an odd one for a sociologist. Flooding as an issue is generally considered to be a topic for the environmental and natural sciences, certainly the author has met with this assumption on more than one occasion. It is thus worth delineating this author's interest in the research topic before explaining more about the study of it. Hammersley and Atkinson (1995: 24) explain how 'research always proceeds from what Malinowski refers to as "foreshadowed problems"'. They highlight, however, that the stimulus for research can take many forms, from a well developed theory, to a surprising fact or even a social event. The reasons or inspirations for the research here are semi-autobiographical, with academic and life experiences coinciding to inspire interest in the chosen topic.

This story starts during the author's final year of degree study (2000/2001) when severe floods occurred across Britain. The floods were met with fairly prolific media interest, not least because they were the second set of severe flooding events in two years. These floods and the reporting of them drew the author's attention because at the same time a course on sociological theory and environmental issues was being undertaken. These events and the social response to them were reflected upon utilising the theoretical framework of newly learnt literature from environmental sociology, time and risk theory. This initial interest in flooding remained and thought on the issues continued after completion of the first degree. Following university

employment was taken up in a mortgage company which also dealt with insurance. At this point it became evident that acquiring insurance cover for properties with a flood risk was becoming increasingly difficult. The insurance company which the author dealt with during their employment had issued a statement refusing cover for flooding as standard. These observations reignited interest in the topic and led to the formulation of some initial questions.

The exploratory nature of the research process has led to the findings already alluded to in the introduction. This research project has thus been data led but there were some broad starting questions which formed the starting point for postgraduate investigation. The questions listed below were given on the funding application and formed the broad basis for the study but even these have only been used to guide the enquiries with the research focus shifting over the course of the project. The initial questions asked were:

- Why does development continue in high risk areas?
- What is the role of the multiple and conflicting interests of relevant actors involved in decision-making processes i.e. environment agency; planning committees, developers, insurance industry, local councils, central government, individual householders?
- What is role of uncertainty in the negotiations and decision-making processes?
- To what extent is time a key factor in considerations associated with the socio-environmental issue of flooding?
- To what extent is the implicit knowledge concerning the detrimental effects of human disruption of the natural environment translated into action and what are the factors that may militate against this?

These questions formed the starting point for the research and were purposely general for the reason that the researcher did not want the project to be overly directed by looking at or testing a particular set of questions or notions. As the research has proceeded and a greater depth of knowledge about the topic has developed the questions which the project answered also evolved. A continual shifting between data and theory has facilitated the emergence of key questions pertaining to 1) the contemporary understanding of flooding, 2) the continuation of practices which

appear unsustainable (e.g. building hard flood defences and/or development of high risk areas), and 3) the relevance of 'risk talk' in the context of tackling flooding given the contemporary conception of the problem. The story told here is shaped around these three main areas of interest. These questions are implicit in the original research questions but are explicitly identified here for greater clarity.

Several writers have identified a difference between research problems that derive from political or practical concerns and those which have a more generic cast (Lofland 1976; Glaser and Strauss 1967). Glaser and Strauss (1967), for example, make a distinction between substantive and formal analyses. They describe 'substantive theory' as that developed for a substantive or empirical area of sociological enquiry and 'formal theory' as research for a formal or conceptual area of sociological enquiry (Glaser and Strauss 1967). This relates to the distinction between theory and data driven research. For this research this dichotomous understanding of research is not reflected in the process. Instead, the interplay between these two delineated forms of analysis has been constant throughout the research process, shifting from substantive to formal and back to substantive.

The endeavour was to conduct a project which was inductive, forming the more specific research questions and drawing the theories together as the data gathering and analysis proceeded. While the project began with the formal analytic concepts of sociological time and risk theory, as a framework through which to view the substantive material, the data has been important in directing the application of conceptual ideas. The research has entailed a constant shifting from the data to theoretical notions which appeared useful in interpreting the data and back to the data itself and this has continued throughout the analyses.<sup>1</sup> This is not to suggest that the author's knowledge and interest in sociological temporal theory has not skewed the analysis; another researcher with different knowledge and/or a different background would have inevitably seen different things in the data, interpreted the data in different ways. Rather, that this research has not involved any notion of 'testing' theory against the empirical. The theory has informed thought and in turn the data has influenced the use of the theory.

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<sup>1</sup> The process of analysis will be explicated with greater detail later in the chapter.

*Bounding the Subject*

As already stated, an initial aim of the research was to gain insight into how the issue is being approached and understood within a range of institutions and organisations. The focus in the data collection has thus been on official organisations as opposed to individuals who have experienced floods. The data have been derived from several different sources (e.g. interviews, document analysis, observation at events), all of which were derived from members of, or texts and statements produced by, organisations and/or institutions with a role in addressing and making decisions regarding flooding. The 'discourse' analysed herein is thus referred to as 'institutional discourse'. This term is utilised merely to indicate the particular data source. The reason for this focus on 'institutional discourse' pertains to the research questions and interests; that is, the study aims to examine decision-making in relation to floods. The public, of course, play a role in decision-making processes through public pressure, consultation processes and so forth; these however were not the focus of this research. Examination of these processes could form a complementary research agenda adding to the present study. Practical constraints (primarily time and limitations associated with being a sole researcher) have required a narrowing of the research aims, which in this case entailed a decision to focus upon expert or institutional actors with a role in relation to flooding (and also climate change as a related issue).

Wynne (1996) contends that the more culturally rooted forms of collective, public knowledge, arising from the non-expert public domain, have been suppressed in the works of writers like Beck (1992a) and Giddens (1990; 1991). Wynne (1996) makes particular reference to the constraints that the neglect of the cultural/hermeneutic (interpretive-explanatory) character of modern knowledge, specifically scientific knowledge, places on the ability to imagine 'new forms of order and how their social legitimation might be better founded'. Clearly, the analysis here also neglects the non-expert public domain. However, to suggest that the non-expert domain is appropriate for study is not to suggest that the expert arena is unworthy of attention. It would of course have been desirable to study both domains and the interplay between them had there been no constraints. Indeed, an examination of both was part of the original design but was found to be beyond the scope of the current project as the



research progressed. Wynne's call for analyses which are inclusive of lay knowledge(s) has been noted as a pertinent follow-on from this research.

In addition to a wider cultural or lay public discourse, the media are omitted as sources of evidence. The significance of media reporting is not under-estimated here however, and a wealth of data from numerous different news media sources spanning almost 10 years has been collected. The task of analysing and including this data in any way that would constitute a thorough enough analysis eventually had to be sacrificed as beyond the scope of this project. Giving the media discourse due attention could have easily comprised another chapter or perhaps more realistically another thesis. Media discourses also formed the basis of analysis for the MSc dissertation and have thus been treated elsewhere in relation to this same topic. The thesis' focus was therefore narrowed to the discourses of those organisations and institutions (or rather *parts* of organisations) with specific roles in relation to flood issues. Like all analyses it is necessarily partial in its extrapolation of the topic under consideration (Inglis 2005). However, these excluded parts could form the basis of future complementary studies and research programmes.

The document and textual data have been collected from a broad range of identified 'stakeholder' organisations. In addition, the interview participants were selected for their roles in relation to flooding (and/or climate change) in a diverse range of settings. The concept of 'institution' is noted as being a diffuse and contested concept (O'Riordan and Jordan 1996). As such, some clarification is required regarding the use of the term in this thesis. Institution is utilised here in a narrow sense to refer to 'fairly concrete organisations, such as Government Agencies' (Smith 1988 cited in O'Riordan and Jordan 1996: 67). Indeed, the terms organisation and institution are utilised interchangeably. This is not to brush over the complexity of the term as in conducting the empirical research it was abundantly clear that 'institutions' are not concrete, rather they are 'continually re-negotiated in the ongoing interplay between human agency and wider structures' (id.: 68). They are comprised of patterns of routinized behaviour, embody rules and function to impose order but they are also dynamic and comprised of the individuals which are active in producing and re-producing those more stable elements. This interpretation of institutions fits with the understanding of the social world and of research in this thesis and is revealed

implicitly through the analysis. A broad list of institutions is provided below. This list is by no means exhaustive but gives a good indication of some of the key organisations and institutions from which the research data have been collected, either through interview, observation or document analyses.

Association of British Insurers [ABI]

Benfield Hazard Research Centre

Consultant Engineering Firms (e.g. Halcrow, HR Wallingford)

Country Land and Business Association

Department for the Environment, Food and Rural Affairs [DEFRA], previously known as, the Ministry of Agriculture, Fisheries and Food [MAFF]

Developers (e.g. Taylor Wimpey UK ltd.)

Environment Agency [EA]

Flood Hazard Research Centre [FHRC]

Flood Risk Management Research Consortium [FRMRC]

Friends of the Earth

Green Peace

Hadley Centre

Improvement and Development Agency [IDeA]

Institute of Civil Engineers [ICE]

Insurance Consultancy

Insurance Providers (e.g. Zurich)

Internal Drainage Boards

Local Government Association

Local Councils

National Flood Forum [NFF]

Natural England, previously English Nature, the Countryside Agency and the Rural Development Service

Office of Science and Technology [OST]

Office of the Deputy Prime Minister [ODPM]/Communities and Local Government [CLG]

Planning and Planning Policy Departments within Local Government

HM Treasury

Tyndall Centre for Climate Change Research

Sustainable Development Commission

United Kingdom Climate Impacts Programme

Welsh Assembly Government [WAG] and prior to devolution the Welsh Office [WO]

Welsh Local Government Association

World Wildlife Fund [WWF]

Data has been obtained in some form from all of these organisations and institutions in an effort to gain an understanding of present conceptions of and approaches to flooding. Decisions in these domains tend to be informed (at least in part) by what Stirling (2005) has termed ‘analytic’ methodologies. For Stirling (2005: 219) ‘analytic’ approaches to knowledge refer to ‘the established, narrow, rigid, quantitative, opaque, exclusive, expert based, analytically rigorous procedures, tending to privilege economic considerations and incumbent political and commercial interests (Collingridge 1980; Flyvbjerg 1998; Wynne 1975)’. He lists approaches such as risk and cost-benefit analysis as examples of this kind of knowledge, utilised in decision-making processes. The decision to focus the analysis on dominantly utilised methodologies (in their generic sense) was taken because they appeared to be so significant in informing decisions and practices. This focus was obviously a product of the focus on ‘stakeholder’ institutions, comprised of experts or people in relative positions of power compared with the average individual affected by flooding. The notion of ‘institutional discourse’ as the focus of this study has been introduced and as such the conceptual implications of discourse require some elucidation.

### *Discourse and Framing*

Framing refers to the process of constructing and representing our interpretations of the world around us (Gray 2003: 12).

Discourse refers to a specific ensemble of ideas, concepts and categorizations that is produced, reproduced and transformed in a particular set of practices through which meaning is given to physical and social realities. (Hajer 1995: 264)

Discourse and framing are two concepts or terms which are frequently utilised in the thesis. Both notions are widely used in and across disciplines and there is no unified concept of either, as such clarification of their use is required. This is a methodological consideration as it relates to the perspective that there is a necessity

for selective observation and interpretation for understanding the social world. Framing, for example, is related to the socio-cultural processes whereby frames for understanding are constructed in the wider world and is used by some to refer to the means by which individuals actively frame their social worlds through selection of particular aspects of importance or world views (Bateson 1972; Goffman 1974; Jasanoff and Wynne 1998; Welsh and Chester 2001). Discourse similarly is often also designated as referring to the production of meaning, as well as power relations through practices (Foucault 1973; 1977; Fairclough 2003; 1995; Hajer 1995; Hannigan 2006). In this sense the concepts of discourse and framing are conceptual categories which link to a constructivist understanding of the world whereby the social world is construed as subjectively interpreted.

The academic roots of discourse can be traced to France (Foucault 1977), while the academic foundations of framing are found in American sociology (Bateson 1972; Goffman 1974). The concepts can be seen as arising as different approaches to a similar problem relating to interpretive approaches to understanding the social world. The use of the concepts here does not constitute a direct application of either of the original delineations. Therefore, this does not constitute a Foucauldian analysis. In this thesis discourse is utilised as a broad descriptive terminology to refer to a general category of linguistic production which subsumes a number of other tactics and devices, including narrative (the writing and telling of stories) and rhetoric (Hannigan 2006).

In a similar way the use of framing in this treatise does not adhere in any thorough way to the original descriptions of the concept, instead the use of the terminology appears to align more closely with that found in the sociology of scientific knowledge literature (Jasanoff and Wynne 1998). This definition of the concept is also not rigidly applied but the analysis is informed by the broad approach to framing as it features in Jasanoff and Wynne (1998). Framing is utilised in the thesis in a descriptive capacity; that is, it is employed to describe the delimiting of flooding as a social problem within the discourses. Framing, as it features here, implies a degree of social construction in understanding and defining social issues- although it is utilised in many other ways across various different disciplines and fields. The aim in this short section is not to

review or analyse the many interpretations of the term 'framing', but merely to delimit how it is used in the thesis.

In some senses 'discourse', as it appears in this thesis, has been used interchangeably with the term 'frame' - understandably given the emergence of the concepts as differing approaches to similar problems. However, discourse is taken here to imply something broader than framing or frames. Framing, in the sense that it is utilised here, refers to the defining of flooding as a social problem, discourse refers to the wider set of 'story-lines' through which flooding is interpreted more generally (Hannigan 2006). Thus, it is not merely definition that discourse implicates, rather discourse refers to the text, talk and speech (translated in to text form for analysis) through which flooding is communicated and understood. Framings comprise part of the discourse, indeed they are the parts focused on, and discourse is a broader category.

A multitude of other authors have attempted some classification of environmental discourses. The analysis here does not constitute any such attempt. Dominant themes of representation or a dominant framing has been derived from the analysis of the discourses around flooding. This framing of the problem is discussed as relating to the selection of knowledge(s) on which understanding of the problem is based. The subsequent analysis deals with how they conflict with embedded and contextual knowledge practices revealing difficulty in acting in relation to the dominant framing. No attempt at a typology of the discourses is made, rather they are analysed in a manner which alludes to the 'messy' nature of the 'story-lines' through which flooding is understood and represented. Historical change in the discourse forms a significant part of the analysis and is seen to relate to the way the issue is conceived and approached. As such, this treatise is more consistent with those analyses of discourse that do not constitute an attempt at typology, such as Lifkin's (1994) account of the changing international discourse around global ozone depletion in the 1980's.

The terms 'stories', 'rhetoric' and 'narrative' are also drawn upon at various points to describe the textually represented data. Discourse is held to encompass these 'tactics or devises', constituting 'the most general category of linguistic production'

(Hannigan 2006: 36). Framing is utilised here in its narrower sense entailing notions of defining problems and social construction, and refers only to discursive framing, as opposed to the broader sense of the term which encompasses other communicative forms as found in the work of Bateson (1972) for example. Discourse and framing are difficult to separate as concepts and although differences between them have been drawn out, these are difficult to maintain in actual analysis. It is worth noting Lidskog's (2001: 124) assertion that the discursive dimension is only one of many that are relevant to sociological analyses. The author concurs with this, however, this does not detract from the value (and the pragmatic virtues) of analysing discourse as a means of accessing the social world.

Framing and discourse, in the way they are taken up here, imply social construction in understanding and defining social issues<sup>2</sup>. Hannigan (2006: 36) notes how 'rhetoricians have drawn the ire of critical realists' for making the claim that nature and the environment can only be conceived through the discursive language that has been developed to communicate about the natural world. Hannigan (2006: 36) takes a more temperate line consistent with the view in this thesis, arguing instead that 'the environment as it exists in the public policy sphere is the product of discourse about nature' established by scientific disciplines, various government agencies, popular texts, media, environmental activists and so forth. The conceptual positioning is seen as linked to methodological decisions. It makes sense therefore to delineate a brief clarification of the constructivist position adopted in this thesis prior to the discussion of the methodological approach and methods.

### *Environmental Realism and Constructivism*

Like many other areas in sociology, the literature which takes the environment as its subject matter has been characterised by ongoing debates related to the constructivist and realist positions of social scientists. Realist and constructivist accounts are probably best conceptualised as a continuum of positions, ranging from what might be termed the strong constructivism of writers like Luhmann (1982), through to the realist accounts of writers such as Martell (1994) and including the attempts at

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<sup>2</sup> It should be noted that it is utilised in many other ways across various different disciplines and fields.

synthesis (Irwin 2001). The realist-constructivist debate has been of particular pertinence with regard to environmental sociology or sociology of the environment. The author makes no pretences to finding a solution to this long-standing debate, intending only to clarify the ontological and epistemological position here, situating it within the wider debates around these issues.

The difficulties associated with social constructivist approaches loom particularly large for the environmental researcher, precisely because these social problems are intimately connected to natural scientific findings and claims. Hannigan (2006: 63) explains that 'while social problems frequently crossover from a medical discourse to the arena's of public discourse and action, they never-the-less derive much of their rhetorical power from moral rather than factual argument'. In relation to environmental issues however, their scientific base (which may be their only base in the case of concerns like climate change) means they are vulnerable to dispute as 'real' issues so to speak<sup>3</sup>.

The constructivist paradigm in this context could be interpreted (often wrongly) as providing support for sceptics. It can be taken up as a basis to question any source for concern and action in relation to environmental problems. Thus, while the sociologist may subscribe inherently to a constructivist position, taking that standpoint can leave them incapacitated, capable of only description, and regardless of intention, may be interpreted as a means to deny the reality of environmental concerns. These difficulties can be seen as inherent in researching environmental (and other) issues from a constructivist position. The research here tends towards a constructivist position, but entails assertions regarding some of the difficulties to be faced in addressing contemporary environmental concerns, and thus favours a more moderate form of constructivism.

Irwin (2001) notes, in admittedly crude terms, that those favouring more realist positions have been critical of the implications of constructivist positions for 1) undermining the reality of environmental problems, 2) denying the separate existence of the social from the natural and 3) failing to develop an adequate analytical

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<sup>3</sup> For example, in the case of global climate change difficulty arises precisely because it originates not as an explanation for observed phenomenon but as a theory about that which is yet occur.

framework for the study of environmental problems. Critics have asserted that at best constructivism breeds agnosticism with regards to environmental issues (Crist 2004) and at worst that it provides justification for the continued degradation of nature (Soule and Lease 1995).

Wynne (2002) poses a clear and pragmatic rebuttal to those who would critique constructivist accounts on these grounds. He asserts that the accusation that social constructionism results in a position which denies that the Earth is 'under siege from a host of environmental hazards', entails a grave misrepresentation of the constructivist position. He contends that only a 'false reductionism' could result in the interpretation of constructivist accounts as claiming that 'environmental risks do not exist or that natural reality plays no identifiable role in producing knowledge about these risks'. Wynne (2002) asserts that the constructivist position merely points to a need to look more closely at the social, political and cultural processes by which environmental issues are defined.

There are specific difficulties that arise in researching this particular topic with regard to notions of realism and constructivism. First, the scientific evidence itself regarding links between climate change and actual weather events is on far more shaky ground than that which indicates anthropogenic climate change is occurring. Secondly, not all nations currently conceive of flooding as (to some extent) a climate change impact. Thirdly, it is the political decision to act upon climate change in relation to flood management which results in the emergence of an attempt to deal with the issue in this context. Thus, regardless of whether or not the scientific consensus is strong with regard to the likelihood of increased flooding in Britain due to climate change, values and orientations of a social, cultural and political kind play a significant role. Along the spectrum of realist and constructivist positioning there have been various attempts at creating a suitable ontological and epistemological position for the sociological study of environmental issues. Irwin's (2001) work with regard to these matters is useful in this respect and resonates with this author's views.

Irwin (2001: 16) has asserted that neither realist nor constructivist positions, *in their extremes*, are 'especially productive in sociological terms'. He proposes that each instead appears to lead to 'ultimately irresolvable and unproductive debate' (ibid.). He



thus attempts to offer a means for transcending these debates around realism and constructivism. According to Irwin, 'neither the natural nor the social can be given paramount status but... instead a process of *co-construction* needs to be recognised and explored' (Irwin 2001: 16). Irwin proceeds from a position which recognises the claims of (most) constructionists within environmental sociology as moderate. He explains that the argument being made by constructivists is not that the natural environment is a mirage or fantasy, but rather that our only way of interpreting (or knowing) the environment is through social processes.

Irwin suggests that constructivism is characteristically concerned to stress the unavoidable problems of epistemology, rather than making any ontological judgements. He asserts therefore that the debates over realism and constructivism are 'rather pointless' when this more temperate version of constructivism is taken up. He thus posits, the challenge is not to battle over constructivist and realist positions but to 'draw creatively on as broad a range of sociological insights - whatever their theoretical provenance' (Irwin 2001: 168). This argument is appealing, allowing researchers greater freedom in their use of conceptual ideas for analysis. Irwin (2001: 168) continues explaining that 'rather than seeking to reach a non-attainable level of theoretical purity, our objective should be to enhance understanding of the relationship between environmental issues and sociology'.

Co-construction, for Irwin, captures 'the dual process of the social and the natural being varyingly constructed within environmentally related practices and particular contexts' (2001: 173). This concept forces critical consideration of both the usages of natural arguments within environmental debates *and* the shifting definition of the social. It is thus still largely constructivist but avoids the 'perils of social reductionism' (ibid.). Irwin is not the only author to offer arguments which can be interpreted as dealing with the realist-constructivist debates in novel ways. Notably, Jasanoff (1999) has theorised ways of overcoming this divide from a sociology of scientific knowledge approach. Latour (1999; 2000) has offered considered analysis with regard to this debate, as has Dryzek (1997). Irwin's assertions are accepted as satisfactorily dealing with this debate for now although, it should be noted that there remains a tension throughout this work. Yearley (1991) offers a concluding note for this brief discussion.

[T]o show that a social problem has been socially constructed is not to undermine or debunk it; both valid and invalid social problem claims have to be constructed. The detachment required for social science should not become an excuse for cynical inaction. (Yearley 1991: 186)

### *Locating the Research Methodology*

As might be expected given the constructivist position, this study entails a qualitative approach to the interviewing, document analysis and observation. Qualitative methods have been designated as more suited to accessing subjective meanings through which the social world is seen to be constructed. Qualitative research has a relatively long history in the social sciences and is linked to particular epistemological debates. In order to locate the research methodology within the conceptual tradition from which it stems, this section entails a brief treatment of the debates and originating claims regarding qualitative approaches.

Historically, qualitative methods have been associated with interpretive and/or interactionist works<sup>4</sup> (Hammersley and Atkinson 1995). These approaches were cohesive in as much as they upheld the view that social phenomena should be regarded as quite distinct from physical phenomena. Generally, they were critical of the experimental approach to studying the social world and proposed that it should be studied in its 'natural' or 'undisturbed' state, not manipulated for experimental procedures. For interpretive social scientists, the social world could not be understood in terms of simple causal relationships and universal laws but required understanding of the social meanings (intentions, motives, beliefs, rules and values) and interpretations through which social actors constructed their worlds.

From an interpretive perspective people interpret stimuli and these interpretations are constantly under revision as events unfold and shape actions. This means that physical stimuli are understood differently by different people or even by the same person at different times. From this perspective, to understand the social world required an approach which enabled the researcher to access the meanings that guide behaviour.

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<sup>4</sup> This tradition is associated with writers such as Lofland (1967), Blumer (1969), Matza (1969), Schatzman and Strauss (1973). See Hammersley and Atkinson (1995); Denzin and Lincoln (2000) for detailed discussion of this tradition.

The links between this view of the social world and the conceptual notions of framing and discourse are evident in that these concepts provide a means of describing the interpretive processes. The primary aim was thus to describe what happens in the setting, how the people involved see their own actions and those of others, and the contexts in which action takes place. The best way to achieve this was not through experiments, for example, but by taking part in the social world that was the object of study.

These early accounts of qualitative research maintained some of the research principles of the natural sciences (Denzin and Lincoln 2000). First, they continued to uphold the notion that the social world should and could be studied in its *natural* state, undisturbed by the researcher. Secondly, it was still assumed that qualitative research could be objectively analysed to provide insight into people's subjective realities. This entailed an apparent contradiction whereby participants were viewed as subjectively and actively constructing their social worlds, both through their interpretations of it and through actions based on those interpretations, but the researcher was granted a unique capacity to objectively observe and understand those subjectively constructed interpretations.

Thirdly, research was still viewed as producing accounts of factual matters that reflected the nature of phenomena studied. This was in contrast to viewing research as inherently reflective of the values or political commitments of the researcher. It was recognised, of course, that in practice research is inevitably influenced by the researcher's values, but the aim was to limit the influence of those values as far possible, in order to produce findings that were 'true' independently of any particular value stance. This position amounted to a constructivist understanding of the social world aligned with a realist view of the capacities of social research. The basic ideas underpinning much of this early qualitative research have thus been critiqued as being incompatible with the view of the research itself.

The traditional approaches to qualitative research and the seemingly contradictory assumptions regarding the way the social world was seen and the way that research was viewed have subsequently come under attack. Shifts in theory have informed a critical discussion of qualitative methodological approaches. Denzin and Lincoln

(2000: 17) note the significance of '*critical, interpretive, linguistic, feminist and rhetorical* turns in social theory' in informing a questioning of key assumptions associated with qualitative research. Hammersley and Atkinson (1995) point to the work of Kuhn, Derrida and Foucault as seminal interventions in this respect. The critical advances in theory have impacted strongly upon the qualitative tradition. There has been a noted shift in qualitative research whereby the old tradition has been supplanted by approaches to qualitative research that pay attention to these emergent critiques. In this thesis, these more recent assertions relating to methodology and constructivist positions are taken up.

The researcher is seen as part of the social world they study, displacing any notions of the researcher as an objective observer of subjective realities. From this perspective, the distinction between science and common sense, between the activities of the researcher and researched, is called into question. It is this distinction which had driven the more traditional approaches to strive for neutrality on the part of the researcher. This endeavour however, comes to be seen as futile when all data are acknowledged to involve theoretical presuppositions. In this thesis, the adoption of a reflexive approach to research has been posited as a means of overcoming some of the difficulties arising from the critique of traditional qualitative research.

Many of these concerns and issues extend beyond qualitative research and similar debates are applied in relation to more quantitative approaches to research. Vidich and Lyman (2000) propose that these assertions regarding methodology, which situate the researcher as part of the social world, apply to both qualitative and quantitative research, and in many senses make such a distinction unimportant. Vidich and Lyman (2000) assert that the social researcher is first and foremost an observer of the world regardless of their choice of method. As observers of the world, those who study it also participate in it. They make observations 'within a mediated framework, that is, a framework of symbols and cultural meanings given to them by those aspects of their life histories that they bring to the observational setting' (Vidich and Lyman 2000: 39). From this perspective all research methods are in some sense equally objective (or rather equally inobjective) as there is no means (including mathematical procedure) by which the inter-subjective element can be eliminated. It is held here

that it is important for researchers accept and make explicit their subjectivities as part of the research process, developing a reflexive awareness.

Hammersley and Atkinson (1995) explain that reflexivity implies that the orientations of researchers will be shaped by their particular socio-historical locations, including values and interests that these locations infer upon them. Reflexivity entails more than recognition of these ideas however, since this notion has long been accepted by many and can be found in early sociological work, such as that of Weber (1904/1949). The difference is not in acknowledging these influences but in accepting that they are an intrinsic part of research that cannot be dispelled by methodological innovations or any other endeavours. The notion that social research can be carried out in some autonomous realm free from the wider society and from the personal biography of the researcher is rejected. Emphasis is also placed on the consequences of knowledge production potentially stimulating courses of action or shaping the political climate; these consequences are not necessarily desirable or neutral.

These arguments regarding social research have created the notion of being able to *represent* a social reality as a central problematic. For some such assertions are seen to consign social research to relativism. The notion of abandoning a realist position for the researcher is seen by some as creating difficulties in finding firm ground from which any knowledge of the social world can be asserted. Atkinson, Coffey and Delamont (2003) posit continuity in qualitative research and suggest that reflexivity does not necessarily undermine all aspects of the traditional approaches to qualitative research. It implies that there are aspects of these traditional understandings which must be rejected but it does not require that researchers abandon their commitment to realism. Hammersley and Atkinson (1995) contend that the critical assertions regarding traditional approaches only undermines 'naïve realism', which assumes that knowledge must be based on some secure foundation. For them, reflexivity does not mean that all research is political either, or that it must be political in the sense of severing particular political ends; 'the primary goal of research is, and must remain, the production of knowledge' (Hammersley and Atkinson 1995: 17). They contend that it is possible to;

...work with what *knowledge* we have, while recognising that it may be erroneous and engaging in systematic enquiry where doubt seems justified; and in doing so we can still make the reasonable assumption that we are trying to describe the phenomena as they are, and not merely how we would perceive them to be. (Hammersley and Atkinson 1995: 19)

From this perspective research is characterised as an 'active' process in which accounts of the world are produced through selective observation and theoretical interpretation of what is seen, heard and written. To suggest that research findings are constructed does not automatically imply that they do not or cannot represent social phenomena. Moreover, any such notion leads to a position which 'assumes that the only true form of representation would involve the world imprinting its characteristics on our senses, a highly implausible account of the process of perception' (Hammersley and Atkinson 1995: 18). Researchers are likely to have an effect on the people they study but this does not mean that the validity of findings is restricted to the data elicitation situations.

Hammersley and Atkinson (1995: 19) explain that 'once we abandon the idea that the social character of research can be standardized out or avoided by becoming 'a fly on the wall' or a 'full participant', the role of the researcher as active participant in the research becomes clear'. In this thesis, this notion of active participation is adhered to in relation to the research. The researcher is the 'research instrument *par excellence*' (ibid.). The variance in attitudes across contexts and the fact that the researcher may influence the context is central to the analysis. Interpretations in this study are made explicit bringing the image of the researcher into parallel with that of the people studied.

The participants themselves are viewed as co-researchers, active in constructing the social world with the researcher. Indeed, the kind of participants interviewed for this study i.e. key actors which held multiple roles over their careers, are noted as particularly reflective. The reflections they offered on their work and the issues they face have been integral to the research story. Hammersley and Atkinson (1995) suggest that in bringing the researcher into line with the researched, the commitment of research to realism can be maintained while at the same time aligning the view of social research with that of the social world. Thus, while it may not be possible to

avoid having an effect on research and while common sense knowledge inevitably enters research, recognizing these limitations does not negate the aims of research.

The qualitative approach is felt to have enabled more detailed in-depth data in contrast to other available methods such as questionnaires, open-ended or otherwise (Bryman 2004). It is asserted that for this research it would have been very difficult to achieve the kind of data derived from the study with a questionnaire approach. In utilising semi-structured interviews the participants could discuss issues and express their views free of the constraints which a more structured format enforces. This approach made for a more interactive discussion where it was possible to probe aspects of interest during the discussion and achieve insight into 'unofficial' accounts of the issues.

This is not intended to suggest a diminished capacity for quantitative approaches; it is merely proposed that qualitative methods were more appropriate for the particular research aims of this study. This decision was made in the full knowledge of the history of both qualitative and quantitative research methods and the debates surrounding them. It is important to note that this author does not view decisions about research methods as entailing a simple process of selection based solely on consideration of the best method for the research problem. In contrast, the processes involved in the deciding research methods are seen as intrinsically related to the concerns of theory and methodology. Atkinson, Coffey and Delamont (2003) surmise;

...in the real world of research scientists do not dream up "problems" to investigate out of thin air, divorced from concerns of theory and methodology, and only then search for the right method. Clearly, problems and methods come as part of a package of ideas. (Atkinson, Coffey and Delamont 2003: 99)

This overarching view of research is taken up in this thesis and is discussed in greater detail with regard to the methods subsequently. These on-going debates regarding methodology and epistemology are discussed in relation to the preferred methods in the next section.

**Methods: Interviews, Observation and Document Analysis**

This PhD has been based upon data obtained from three distinct methods which have been utilised together in order to obtain a fuller picture of the issue under study and the social world that exists in relation to it. In-depth semi-structured interviews, documents analysis and observation have all been adopted as techniques. As noted, a qualitative approach to these individual methods has been adopted in this study. This decision was taken, in part, because of the noted capacities that this approach provides in furthering the elicitation of greater depth and of the nuances in understanding of the issues (Flick 2002). The interviews were complimented by conversations and observation at events and in institutions which dealt with flooding and related concerns. The qualitative document analysis formed a further integral part of the process of learning about the issues under scrutiny. In this section the methods are discussed as distinct from one another with the links between the methods being made throughout.

The discussion of the methods begins with interviews and interviewing before comparisons and interconnections are drawn with the other methods. In the first part of this section the shifts in epistemological understanding of qualitative methods, discussed above, will be applied with specific reference to interviewing. The interview is examined critically as a means for achieving knowledge about the social world and conclusions are offered regarding the understanding drawn upon herein. Following this, the utilisation of interviews in this research, including the description of the fieldwork experiences, will be discussed. The document analysis and the observation work are treated subsequently and the links between the methods are drawn through these discussions.

***A Note on Triangulating Methods***

The choice of the researcher to triangulate methods was taken with the aim of achieving a better understanding of the topic under investigation than may have been possible with only one method. Denzin and Lincoln (1998: 144) assert that 'combining multiple methods... in a single study is best understood as a strategy that adds rigour, breadth and depth to any investigation'. According to this understanding



the use of multiple methods and empirical materials in this study can be viewed as adding to the research. The acceptance of such an assertion, regarding the combination of methods, should be viewed critically, as while the combination of methods may enhance research, it does not automatically follow that research will be better simply because more methods have been employed.

Within qualitative methods there has been a reasonably strong history of utilising more than one method. Qualitative ethnographies, for example, have for many years routinely involved both observation and interviewing. There are thus recognisable debates regarding the use of methods together. Some depict the triangulation of methods as a means of solving problems associated with individual methods (Henn et al 2006). Henn et al (2006: 20) suggest that individual methods can be combined 'not only to gain their individual strengths, but also to compensate for the particular faults and limitations of any single method'. This notion is regarded critically in this research.

Atkinson and Coffey (2001) point out that triangulation does not solve all methodological problems. They contend that to assume this power in combining methods highlights a naivety on the part of the researcher and a simplistic understanding of the individual methods. The potential benefits, noted by Denzin and Lincoln (1998), that might be derived from combining methods are not simply achieved through the combination itself. As such, the problems associated with each of the methods employed in the study require discussion since they can not be assumed to be solved by the utilisation of more than one method. It is regarded as important to discuss the methods, and the forms of data they produce, as distinct from one another. The intersection between methods is considered to be important and the points of connection will be discussed throughout.

### *Interviews as Windows on the Social World*

Fontana and Frey (2000) highlight a general 'reliance on interviewing' in social research. At the broadest level interviews entail some kind of question-answer format. Gilchrist (1999: 355) defines an interview as 'some sort of formal discourse'. Denzin and Lincoln describe an interview as 'a conversation, the art of asking questions and

listening' (2000: 633). They suggest that '...we live in an interview world, in a society whose members seem to believe that interviews generate useful information about lived experience and meanings' (Denzin and Lincoln 2000: 633). Fontana and Frey (2000) explain how there is faith in the interview as a means of achieving trustworthy and accurate knowledge of the social world and in the notion that the relation between interviewer and interviewee does not unduly bias the account. This understanding of interviews has been questioned and critiqued and there has been an increasing realisation that interviews are not neutral tools of data gathering but are 'active interactions'. It is this active interpretation of the interview process that has been taken in this research.

Conventionally, interviews have been regarded as means of extracting information from individuals and the focus has been on the interviewer and their capacity to achieve the necessary insights. Emphasis is placed on the role of researchers in managing the interview to try to standardize conversation; Holstein and Gubrium (2004: 146) explain 'the interviewer must shake off self-consciousness, suppress personal opinion and avoid stereotyping the respondent'. They outline how 'from a more traditional viewpoint, the objectivity or truth of interview responses might be assessed in terms of reliability, the extent to which questioning yields the same answers when and wherever it is carried out, and validity, the extent to which enquiry yields the "correct" answers' (Holstein and Gubrium 2004: 145). As discussed above, in more recent years, many researchers have begun to question some of these widely held assumptions about interviews, which are underpinned by the more traditional approaches to qualitative research.

In contrast to these more traditional approaches, Holstein and Gubrium (2004) propose the notion of 'active interviewing' emphasising, the role of researched *and* the *researcher* in creating the interview data. In this research the interviews have been understood as an active process involving both interviewer and interviewee in the processes of construction. The interview process is seen as producing 'situated understandings grounded in specific interactional episodes' (Denzin and Lincoln 2000: 633). Meaning is not construed as merely elicited by appropriate questioning, or unproblematically conveyed through interviewee's answers, it is actively and communicatively assembled in the interview encounter. The interviews are thus held

to be 'collaborative accomplishments' which involve participants in 'meaning-making work' through the process (ibid.). For Holstein and Gubrium there is no way to strip interviews of their interactional elements and such endeavours will be futile. Instead they propose that it is important to consciously and conscientiously attend to both the interview process and the products that interviews generate in ways that are more sensitive to the social construction of knowledge. This sensitivity entails a reflexive awareness on the part of the researcher throughout the research process.

Viewing the interview process as an 'active' interactional episode means that notions of minimising bias become unimportant (Holstein and Gubrium 2004). The structuring of the interview in particular ways as a means of ensuring the extraction of truth becomes insignificant from this perspective, since the subject is actively constructing the details of experience into 'artifacts of the occasion' (Holstein and Gubrium 2004: 145). In this sense there is no notion of 'spoiling' what the subject and interviewer are subjectively creating. Fontana and Frey (2000) assert that there remains some worth in considering the influence which the researcher and the interview context may have in the interview process. They argue that it is possible to acknowledge the inevitability of the interview being an interaction in which the researcher plays an active role without abandoning an attentive approach to the interaction process. Fontana and Frey (2000: 666) draw on Geertz's (1973) interpretation of Robert Solow to clarify this position, stating 'just because complete asepsis is impossible doesn't mean that we may just as well perform surgery in a sewer'.

Fontana and Frey (2000: 646) note that the focus for some critics has come to be 'the *hows* of people's lives (the constructive work involved in producing order in everyday life) as well as the traditional *whats* (the activities of everyday life)'. In order to examine the *whats* of everyday life it remains necessary to uphold the belief that interviews can provide knowledge of the social world beyond the interview context. Should this assumption be entirely rejected then the interview, as a source of information about the social world, becomes difficult to uphold. This assumption is not accepted unproblematically here, but has been reflexively questioned throughout the research process. The capacity to discuss the world beyond the interview context is upheld here. The approach is thus one where the data achieved are understood as

active constructions of knowledge but that this does *not* mean that they tell us nothing about the social world beyond the interview context.

Miller and Glassner (2004) map a position which offers a delicate balance in conceptual understanding and is thus useful in overcoming this difficult implication of the processes of active interviewing. They assert that 'to assume that realities beyond the interview context cannot be tapped into and explored is to grant narrative omnipotence' (Miller and Glassner 2004: 129). The roots of these realities they continue are far more pervasive and fundamental than such a position could encompass. To suggest that realities are continually created through interactions, of which the interview process is one, does not mean that those realities are not relatively constant or stable. This means that the construction of experience in the interview process is unlikely to differ wildly from the constructions utilised to manage and understand daily experiences.

Miller and Glassner (2004: 129) explain further that 'language shapes meanings but also permits intersubjectivity and the ability of wilful persons to create and maintain meaningful worlds'. However, for them this recognition does not entail acceptance of the proposition that interviews do not yield information about social worlds. Instead, they contend that two persons can communicate their perceptions to one another. They assert that it is possible to study *what is said* in that discussion with full knowledge of the structures and 'pollutants' that shape it. Utilising Denzin's description they of course accept that there is no way to 'stuff a real-live person between the two covers of a text' (ibid.). They contend only that it is possible to 'describe truthfully delimited segments of real-live person's lives' (Miller and Glassner 2004: 129). It is this conception of the capacity of interview data which is taken up here.

### *This Study and the Interviews*

A total of eighteen interviews were conducted with high level key actors with a role in relation to either flooding and/or climate change. Sixteen of the participants had roles directly related to flooding and water issues; two of the interviewees held positions in relation to climate change, but also had connections with the field of flood risk

management. The participant's roles in relation to flood risk were diverse. They included jobs entailing the management and planning of flood management schemes, directors of environmental engineering consultancy firms, research positions in policy institutions, and policy making. All of the participants operated at senior levels in their respective institutions or organisations. They thus tended to have a broad view of the issues and decision-making with regard to flooding, as well as having detailed knowledge of the processes within their particular institutions. Several of the participants had worked in a range of different positions in relation to flooding during their career. They could thus offer insight into the workings and understandings of more than one organisation, and the shifting conceptions of, or approaches to, flooding across time. Diagram 2 (page 41) provides an outline of the institutions sampled, with stars (\*) to indicate the body from which interview participants were selected.

The interviews were qualitative semi-structured interviews or 'guided conversations'. According to the arguments outlined above a structured approach to interviewing would not minimise or eradicate interactional effects thus any such concerns that might arise regarding semi-structured interviews are not regarded as significant. It was asserted that subjectivity is an intrinsic part of all research and thus cannot be dispelled through methodological innovation. Rather than utilising methods as a means of removing or minimising subjectivity, from this perspective it is important to remain reflexively aware and make explicit the values and theoretical lens through which the social world is viewed. As asserted, these notions regarding the inevitability of interactional effects and subjectivity in research does not mean abandoning an attentive approach to the interaction process (Fontana and Frey 2000). It is important to be assiduous in noting the effects of the interaction while acknowledging that they cannot be diminished by any methodological approach.

The first two interviews were carried out face-to-face and a structured interview schedule was *not* utilised. For these interviews the only structuring contrived by the researcher was that they would entail discussion of flooding, and also climate change. In addition, the participants were asked to talk about their experiences in relation to their work, although personal experiences with regard to flooding also often entered the discussions. The conversations were focused around very broad central points.

These first two interviews were transcribed and an interview schedule of broad open-ended questions was derived from them (see appendix); the subsequent interviews were thus slightly more structured. Interestingly, in retrospect, while the interviews without any schedule may have been more demanding, they resulted in more in-depth data and descriptions of daily work practices which were particularly telling. This observation can be taken as indicative of assertions made earlier regarding the less structured qualitative approaches to interviewing enabling more in-depth accounts.

The in-depth nature of the research materials derived from the interview processes were important in facilitating insights which could be examined in relation to the theory (see chapter three). The data allowed insights into the differing temporal dimensions of the issues under investigation. For example, it is asserted that the way participants talked about flooding as a climate change impact, locating such an association in the future but not in the present (see chapter four), would not have been revealed through a quantitative approach.

The aspects of importance in discussing the interviews have been identified as relating to sampling, access and the interactions between researcher and researched in the construction of the data. The processes of sampling, accessing data, and actually conducting the interviews are viewed here as intertwined and every aspect is seen as important in the production of the data in the interviews. It has been difficult to separate out these issues for discussion and consequentially they are treated in conjunction with one another. Greater clarity will thus be given to the actual processes of carrying out the interviews as this discussion progresses. The processes of sampling constitute a starting point.

The sampling process was shaped by various difficulties associated with gaining access to the kind of participant identified as the focus for this study, i.e. social actors with senior roles in institutions. The concerns relating to access shaped the choices made with regard to sampling and the different sampling procedures resulted in varying success with regard to access. It thus makes sense to discuss these two methodological concerns together as they are intimately connected. In light of this situation the sampling procedure was what might be referred as 'theoretical sampling' (Glaser and Strauss 1967; Charmaz 2000). Finch and Mason (1999) discuss the

concept of theoretical sampling as having become part of the tradition of qualitative research. They describe this form of sampling as involving the selection of a study population on theoretical rather than statistical grounds. This means of sampling allows for the flexibility required in this research project for sampling participants purposively.

Finch and Mason (1999) explain that research projects of this type often entail decisions that simply cannot be taken at the start of the research project. Instead, theoretical sampling processes require flexibility and involve reflection and decisions during the research project. This study has necessitated that decisions be taken at various stages in the process. However, these decisions have not been ad hoc; rather they have been informed and situated i.e. decisions taken have been informed by the research itself (rather than being random) and have always been taken with the original principles for the research as a basis. For example, a decision to sample participants that had a role in relation to risk research was taken as it became apparent through the research that the 'risk-basis' for decision-making with regard to floods was an integral part of the policy approach to tackling the issues. The original identification of institutions significant in flood management remained important in such decisions.

In this research the sampling decisions were taken on the basis of a desire to investigate decision-making with regard to the environmental concern of flooding; a random sample of the population as a whole would clearly not be adequate in light of these research concerns. 'Representativeness' is thus not an aim of this form of sampling. Rather, some degree of generalisation is ensured through systematic decision-making in relation to the sample population. Congruent with this type of research sampling, decisions are taken throughout the research process. As explained above, these decisions have been intimately connected with issues regarding access to the target population. The following discussion reveals the decisions as they have been taken with regard to sampling during the research process. In addition, the ways in which concerns regarding access have intersected to force a degree of pragmatism in the decisions are revealed.

Interview participants were sampled utilising a range of techniques. Initially the analysis of documents and web based research formed a basis for selection. As already noted, participants were selected for their role in relation to flooding (and climate change as a related issue). The additional criterion for selecting participants was that they had roles in different organisations or institutions with involvement in these issues and thus could provide a different perspective. Further, participants needed to either have a direct role in decision-making in relation to flooding or hold a position which was in some way influential with regard to decision-making. The multitude of organisations that have involvement with flood issues meant that it was not possible to obtain a participant from every organisation.

A report from The Flood Hazard Research Centre identified over 700 stakeholder organisations when mapping stakeholders in flood risk management. The decision was taken to select *key* organisations or institutions that had roles in relation to these concerns. Initially, these were identified through the document analysis and web based research during a prolonged period of investigation spanning two years and utilising various sources. The list of institutions sampled has already been detailed. A diagram of the bodies selected, with stars (\*) to indicate the bodies with which participants were affiliated, is provided on the following page. As stated, all participants held high level roles within the institutions selected.

The initial decision regarding the organisations that needed to be included was taken with a mind to expanding as the research proceeded. As such, a question was included in the interview schedule asking participants which groups, agencies or people they viewed as important in relation to flood management (see appendix). In addition, during the observation work and conversations in the field the institutions that had been selected were interrogated against the ongoing research. This included attending a Flood Risk Management Research Consortium (FRMRC) meeting, part of which specifically involved the identification of stakeholders in relation to flood management from the perspective of those in the field<sup>5</sup>.

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<sup>5</sup> This was part of the FHRC study cited above which resulted in a chart identifying the groups and organisations with a role in relation to flood management (FHRC 2005).



## Policy-Political

Treasury \*

Department for  
Environment, Food and  
Rural Affairs (Defra)  
\*

Operating Authorities

Local  
Councils

Environment  
Agency (EA) \*\*\*\*\*

Internal  
Drainage Boards

Office of the Deputy Prime  
Minister / Communities and  
Local Government  
\*

Planning Policy Teams in  
Local Government  
\*

Welsh Assembly  
Government WAG

Local Government Association  
Welsh Local Gov. Association  
Improvement and Development Agency  
IDeA

## Scientific/Academic

*Natural  
Scientific  
Research  
bodies*

*Other (e.g.  
Engineering  
g-Social  
Sci.)*

Tyndall  
Centre for  
Climate  
Change  
Research \*

Flood  
Hazard  
Research  
Centre  
FHRC \*\*

United  
Kingdom  
Climate  
Impacts  
Programme  
UKCIP \*

Benfield  
Hazard  
Research  
Centre \*

Hadley Centre

EA funded University Flood  
Research Institute \*

Flood Risk Management Research  
Consortium FRMRC \*\*\*

## Independent (e.g. NGOs)

World Wild Fund

Green Peace

National Flood  
Forum NFF  
\*

Natural England

Country Land and  
Business  
Association

Institute of Civil  
Engineers \*\*\*\*\*

Sustainable  
Development  
Commission  
(Independent  
organisation  
funded by Gov. to  
provide advice on  
sustainability)

## Industry

*Engineering  
Consultancy  
and Developers*

*Insurance*

E.g. Halcrow, HR  
Wallingford \*\*\*\*\*

Association of  
British Insurers \*

E.g. Taylor  
Wimpey UK Ltd. \*

Zurich – Insurance  
based financial  
services provider \*

Insurance  
consultancy \*

The focus in this thesis is upon discourse in institutions and bodies linked to flood management in England and Wales. As such, this diagram provides an outline of the main institutions identified as having links with flood management for the purposes of this study. The organisations are divided according to categories devised for analysis outlined on pages 68-69. These were necessary for the purposes of anonymity. The red stars indicate the (primary) institutional affiliations of the interview participants. Black stars are utilised to indicate where participants held roles in relation to more than one institution (i.e. black stars refer to secondary roles for the purposes of the thesis). In cases where the data utilised made reference to their knowledge of differing organisations they had previously had roles within these are also indicated with black stars.

## Caption for Diagram 1: Notes on the Roles of Bodies with links to Flood Management

Policy-Political (including institutions or bodies which have some direct link with political sphere)

Defra has the primary policy role in relation to flood management however policy development is shared with the Environment Agency. Defra allocates funding for flood management activities to the operating authorities identified in the boxes below Defra (i.e environment agency, internal drainage boards and local councils). The environment agency receives by far the highest percentage of Defra funding and is identified here as holding a highly significant role in relation to flood risk management, although it should be noted that its powers in relation to planning are limited to providing guidance and placing objections<sup>1</sup>. ODPM/CLG has responsibility for planning policy and delivers the policy planning statements. Local councils (planning departments) approve or deny planning applications. Internal drainage boards are independent bodies with responsibility for land drainage and non main rivers- the EA is responsible for main rivers). They are classified in this category for the purposes of the diagram because they are one of the operating authorities responsible for aspects of flood management however, they are independent bodies and would have been labelled as such in the text were any participants primarily affiliated with an internal drainage board. WAG has particular devolved powers for Wales in areas such as planning. However, there are strong similarities between England and Wales in policy direction and approach e.g. the local development framework (2004) is to be applied across England and Wales. Bodies like the IDeA, the Welsh local Gov. Association and Local Gov. Association promote better local Government and represent the interests of local Gov.

Scientific/Academic (including natural scientists, engineers based in academic institutions and social scientists)

Academic institutions work with the policy sphere in some instances (e.g. the FHRC has been responsible for much of the economic calculation in relation to flood risk calculation; in addition, research into flood risk modelling, for example, may be carried out in academic institutions). The Tyndall Centre and UKCIP have roles in climate science but with a focus on adaptation issues, such as flood risk, and provide advice on these issues in relation to climate change. The FRMRC was a body set up to facilitate development of the Defra/EA research themes across institutions.

Independent Organisation (including NGOs)

NGO's have influence on policy and are active in various debates and research related to flood management e.g. habitat loss and negative environmental impacts through disruption of natural systems. The NFF is a charity set up by people that have experienced flooding to provide support, knowledge and help to those affected by floods. They also work with other organisations, like Defra and the EA and lobby Government for flood alleviation.

Industry (including consultants, engineers and insurance)

Engineering consultancy firms (I provide examples of such firms in the diagram) provide the expertise required for the design, construction and implementation of flood management schemes for the EA, developers (e.g. Taylor Wimpey UK Ltd) and individuals investing in flood management. They are active in devising site specific flood risk assessments as part of environmental impact assessments. Engineers with long careers in flood risk management have first hand experience of implementing flood management schemes, and working with other bodies involved in the processes (e.g. local councils, Defra, EA, ABI, developers). The ABI is the trade association for Britain's insurance industry. Its nearly 400 member companies provide over 94% of the insurance business in the UK (ABI 2007a). Major insurance providers were sampled for more specific insight into insurance company procedures with regard to flood risk, with an interview participant selected from one of these insurance companies. Consultancy for insurance companies entails advising the insurance sector, in this case on climate change and flood risk impacts.

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<sup>1</sup> In 2003 over 600 new building projects, mainly residential, were given planning permission against the advice of the Environment Agency (Crichton 2005)

It should be noted that there are of course a number of organisations or groups that might be considered important that are omitted from the sample e.g. the national farmers union is an important body as it represents farming communities, which are considered to be of importance in flood management. This is felt justified on the basis that 1) the scope of the research was limited by time and by my being the sole researcher on the project, and 2) the bodies selected were identified as having highly significant roles in relation to flood management through various means i.e. initial desk based research, observation work and conversations in the field, and interview questions.

The original sampling proceeded through identifying and contacting participants from within these *key* organisations. This involved establishing lists of important actors from within those institutions. For example, in the Environment Agency, the head of flood risk management (David Rooke) and the head of water management (David King) would have been part of the original list; in the Association of British Insurers, the Head of Household and Property (Jane Milne); in Defra, the Head of Flood Management (Sarah Nason) and so forth<sup>6</sup>. Actors whose names repeatedly appeared in the documents and web based searches were targeted as potential participants even if they did not belong to any of the key organisations originally identified. This decision was taken for the reason that they appeared to be significant actors in the networks. The institutions they belonged to were added to the list of the original sample at the point at which they were identified.

Once participants had been identified for their role in a relevant organisation a letter and/or email was sent out requesting an interview (see appendix). Following this initial correspondence the actual time and date of the interview was organised either via email or the telephone. Several rounds of letters and emails were sent out during the research process, some of which received no reply. In other cases a correspondence was struck up but arrangements were cancelled and rescheduled on several occasions, never actually reaching interview stage. This was a significant and

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<sup>6</sup> Those participants that did not respond to requests for formal interviews (such as the head of flood management in Defra) still informed the research analysis as the researcher attended events at which they were present and discussed the issues with them in a more informal setting. These conversations were recorded as field notes and informed the research story but the extracts from the conversations are not reproduced in the thesis. The interview and document data provided ample illustration of the notions derived from analysis without directly including the material from the observation fieldwork.

time consuming problem in the recruitment of participants. These difficulties became apparent at a relatively early stage in the fieldwork and several different approaches to sampling were adopted to address these problems.

The observation fieldwork served a dual purpose in this respect, acting as both a source of data in its own right, and an opportunity for the recruitment of interview participants and carrying out of interviews. Indeed, meeting participants at events and conferences proved a useful tactic in securing interviewees. In addition, and equally as important in gaining respondents, a snowball sampling technique was employed (Becker 1963). Participants were asked at the end of the interview if they knew of any persons that it might be important for the researcher to speak to. This was a useful tactic both in gaining a clearer picture of networks within and between institutions, and in securing interview participants.

These means of sampling offered pragmatic value in securing the types of participants wanted, i.e. those holding key positions and having a broad understanding of the issues, as well as detailed knowledge of their particular organisations or departments. Meeting people in person and discussing the research before requesting an interview enabled interviews to be secured that otherwise may not have been possible. This is supported by the fact that prospective participants, which had previously had been unresponsive, agreed to interview after having met them at events. The snowball technique too was extremely effective, particularly in the cases where participants agreed to 'sponsor' the recruitment attempts i.e. by suggesting their name be mentioned in correspondence or in one case emailing potential interviewees on the researcher's behalf. Participants were also asked as part of the interviews which institutions they considered to be important. Thus, decisions were taken regarding selection of institutions during the research process, with organisations being added as seemed appropriate from the observation, interview and document analysis data. The list given previously in the chapter has been expanded and refined throughout the research process. These decisions were taken based on participants views on which organisations were important, and the researchers own observations in the field work and document analysis.

The use of snowball sampling and the observation fieldwork for recruitment were practical choices, given the difficulties encountered in securing interviews with the kinds of participant that were the focus of this study. These approaches to sampling proved successful in terms of securing access. It was necessary, however, to ensure that the participants came from different organisations or had very different roles in an institution or organisation. All of the participants worked within different places with the exception of four who worked in very different roles within the same institution (for example, one at a national level and one at a regional level of the organisation). Interviewees have been divided into broad categories primarily in order to ensure anonymity but also because some contextualisation of their role in relation to flooding was necessary for analysis. These categorisations are detailed and discussed in a later section of the chapter. The diagram adjacent to page 41 is divided according to these categories, which are utilised in indicating the origins of illustrative extracts utilised in the text throughout the thesis.

The difficulties in gaining access to participants and the interplay between access and sampling elaborated above is one element of 'access' as it is understood here. Important in terms of access is gaining entry to the social world being studied, the success of access is thus not determined solely by gaining the relevant participants for interviews, for example, but in achieving strong enough access to achieve *understanding* of the social world. Access is thus positioned here as being continually negotiated throughout the research process. The implications of this understanding are that the *quality* of the interviews themselves is important in achieving successful access. In addition, negotiating access to relevant participants at the events attended, where more ethnographic processes of observation and discussion were employed, was important in actually gaining data from these events. The focus for now will be accessing the data in interviews; access as it relates to observation work will be discussed in the section on observation.

This notion of 'accessing data' is being utilised to refer to potential difficulties or successes in achieving 'good' data. Thus, interviews whereby access was not being achieved and thus good data was not forthcoming would be those where an interviewee was unwilling to answer a question, where answers were short and unrevealing, where the conversation was stunted, where misinterpretations of

meaning occurred repeatedly, where participants very obviously engaged in 'front work'<sup>7</sup> (Goffman 1959), and where there were constant interruptions with the participant appearing not to be interested or engaged. These possible difficulties are seen as potentially resulting in data that does not (really) afford the researcher sufficient insights into the social world they are examining. This is not to imply any notion of extracting 'truth', as noted, interviews are viewed as processes through which construction of a collective reality occurs. It is merely to suggest that in interview contexts where the participant does not engage in conversation and where the researcher is intuitively aware of discomfort it may be more difficult to derive any representation of the social issue from that data.

The different mediums for conducting the interviews, as well as the setting, rapport, personal characteristics and timing can all be seen as important factors in the interview process that are perceived to have some effect upon accessing data. The following description of the interviews entails discussion of the differences in interviews and the effects these variations seemed to have on accessing data. Seven of the interviews were conducted face to face with the remaining eleven being conducted by telephone. These different ways of conducting interviews obviously alter the nature of the interview process. The interview contexts involved different kinds of interaction that have implications for the subsequent data. As noted previously, regarding the interview as interactive does not mean there is no worth in considering the influence which the researcher and the interview context may have in the interview process. There were various pragmatic reasons for utilising telephone interviews; most prominent of these was the need to secure the time for the interviews with individuals in high level positions. The initial correspondence requested either a face-to-face or a telephone interview and it was left to the individual to decide. It became clear that many of the interviewees would not have agreed to a face-to-face interview. The telephone interviews were thus important in accessing participants.

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<sup>7</sup> Goffman (1959) utilises a dramaturgical metaphor to depict social interaction as performance. In the performance activities which individuals engage in, they are noted to accentuate certain matters and conceal others. 'Front' refers to the 'expressive equipment of a standard kind' employed during performance (Goffman 1959: 32). Goffman gives attention to the conscious action of individuals to make use of these fronts. In this sense engaging in 'front work' entails use of 'fronts' to perform a consciously chosen role. Here, it is suggested that participants could engage in forms of 'front work' to demonstrate only their professional 'front', for example.

This particular way of interviewing had the added benefit of entailing less time and expense (e.g. for travel). There are potentially, however, difficulties in telephone interviewing regarding the depth of data attainable. In this sense access to 'good' data so to speak might have been hindered by the use of the telephone. In the case of this study, it does not seem to have had any significant effects on the quality of data elicited from the interview process. The participants' willingness to contribute openly in the interview did not seem contingent on whether it was a face-to-face or telephone interview. Instead, the rapport between interviewer and interviewee and, interestingly, the extent of structured questions in the interview schedule, had the greatest effect on the depth of data obtained and the length of interview. The most successful interviews in terms of rapport were also the most fruitful ones in accessing more participants and more data after the initial interview. Overall, rapport and the extent of structured questions were the most important factors in the data achieved. However, it is worth noting that there was a greater level of discomfort observable in discussing issues with those participants that have been labelled 'political'- particularly those involved in policy decisions<sup>8</sup>.

Denzin and Lincoln (2000) note how the interview process is influenced by the personal characteristics of the interviewer (e.g. gender, race, ethnicity, age and so forth). These issues have been designated as central to any research and as important to maintain reflexive awareness of throughout the research process. It is important therefore to discuss the interactional effects and the impacts they may have had on the data produced through the interviews. Telephone interviews involve a different form of interaction that means that the interview process is experienced differently by both researcher and interviewee. Not being able to see each other, for example, has obvious implications for the interaction. This was felt to have had particular significance in the context of this research as the researcher was aware of their relative young age (as well as gender - although this obviously was not altered by the telephone interview) in the face-to-face interviews.

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<sup>8</sup> Different participants were involved in different kinds of decision-making with regard to flooding e.g. some were involved in policy making and affected decisions in this way, others made decisions with regard to the construction of flood defences. Those involved in policy making seemed more uncomfortable than those in other areas of decision-making.



In the interview process the effects of interviewer characteristics are very difficult to determine although intuitively it is clear that they have an effect. This researcher has the appearance of being a young, white, middle class female<sup>9</sup>. The interview subjects on the whole were in appearance, white, middle class, European (although this is not true for all the interviewees), predominantly male (15 of the participants were male while 3 were female) and held positions of expertise or power relative to the interviewer. The way the interviewer dressed also appeared to have an effect; wearing smart clothes seemed important in a context where many (if not all) of the participants dressed in suits. The perceived similar characteristics were no doubt as important as the differences. The telephone interviews thus meant that certain effects felt during the face-to-face interviews and associated with the researchers' personal appearance characteristics were not so important. It did of course remain important to maintain an awareness of the effects of the particular interactional context.

A further characteristic not masked by the use of the telephone is the researchers' relative social position. The position of the researcher as a post-graduate student could have had negative effects on access. Hoffman (1980) notes her difficulty in obtaining access to the data she required as being in part due to her social position. She explains her difficulties in gaining access to influential elite members of the community she studied.

Introducing myself as a sociology graduate student, I had very limited success in getting by gatekeepers of the executive world. Telephone follow-ups to letters sent requesting an interview repeatedly found Mr X 'tied up' or 'in conference'. When I did manage to get my foot in door, interviews rarely exceeded a half hour, were continually interrupted by telephone calls... and elicited only 'front work', the public version of what hospital boards were all about. (Hoffman 1980 cited in Hammersley and Atkinson 1995: 61)

These issues which Hoffman (1980) describes did not occur in any notable way in this research project. Instead the 'student' position arose as an interesting benefit in access. For this researcher, the position of 'student' appeared to work in a favourable way, making participants feel more at ease to engage in lengthy and reflective conversations about the issues. In addition, one of the participants suggested that the

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<sup>9</sup> Although as an aside the researcher comes from a working class background and considers themselves as such, however, others generally interpret their social class background as middle class.



position of 'student' be clearly identified in communication with the interviewees they recommended as contacts as a way increasing their willingness to participate. The optimisation of this advantage though entailed what might be termed emotional labour (Hochschild 1983), whereby the researcher negotiated a delicate line between demonstrating their knowledge of the area while effacing themselves in order to earn 'better' data.

There were various other differences in the interview circumstances for example, one participant apologised for any noise as their office was currently being modified and was thus described as a 'building site'. This had no identifiable effect on the interview or on the data achieved. Indeed, despite the various permutations' in interview context the most notable differences which appeared to have some negative effect on accessing the data (e.g. where answers given were short, the conversation stunted, sentences not finished or statements not elaborated) were derived from the personal rapport between the participant and interviewer. These difficulties were rare in the interview process and even these did not constitute 'front work' and still comprised interesting data (Goffman 1959).

The only other identifiable factor which seemed important in accessing data was the institutional affiliation with a political body. These interviews were more difficult in respect to eliciting descriptions of work and more 'backstage' information, although they were still on the whole successful and delivered some interesting insights into the representations of the issues. These noted difficulties regarding interview context have been treated as data themselves, having been viewed as reflective of aspects of the social world under study i.e. that those in policy roles were more restrained in the interview discussions is treated as interesting and could be interpreted as reflective of the culture of such organisations.

Despite these generalisations it is difficult to discuss 'the interviews' as a homogenous group, since every interview was a unique experience with differences in setting, context, dynamic and so forth. It is important to acknowledge the unique qualities of each interview. However, to discuss every interview as it was experienced from the researcher's perspective would create an unnecessary level of detail for

discussion of the methodology. It is asserted that overall, the interviews produced in-depth, salient and rich data and the negotiations for 'access to data' were successful.

Earlier in this chapter the debates relating to how interview data should be understood were touched upon. As previously noted the interviews are not taken to provide insights into the authentic meanings through which people understand their worlds, but are construed as contexts in which interviewer and interviewee take on roles and construct a narrative. The contention here is that these narratives can tell something about a social world beyond that interview context. It is possible to study the *what* in interview transcripts and derive from that analysis a story of the social world under scrutiny. This is only one story of many that could be told.

In line with Miller and Glassner (2004) the position here is one which refuses to be pushed into the dualist categorisation of interviews as either belief in external realities or as solely local events. Interviews can provide insight into the world beyond the interview context even though both interviewer and interviewee are equally implicated in the creation of meaning. They can tell something about the meanings through which people construct their worlds even though naïve realism must be abandoned. Interviews remain an important tool through which one can find out about social worlds and create stories which add to knowledge of those worlds. The discussion now turns to the document analysis. As a method for achieving knowledge of social worlds document analysis poses its own difficulties for research.

### *Documents as Part of the Social World*

Atkinson and Coffey (2004) suggest that it is important to study documentary realities precisely because 'many qualitative researchers continue to produce ethnographic accounts of complex, literate worlds as if they were entirely without writing or texts' (Atkinson and Coffey 2004: 56). They suggest that many studies of organisational, professional and even educational or academic settings implicitly represent them as devoid of documents and, as such, it is necessary to 'redress this imbalance if only for the sake of completeness and fidelity to the settings of social research' (ibid.). Inclusion of documentation in analyses does not pose a particular difficulty *per se* and

is an important aspect of the social worlds under scrutiny. As such, they *require* study to achieve a better picture of the social issue or setting being researched.

Alongside the interviews document analysis formed an important method for data collection in this study. Interviewing and document analysis are distinct from one another as methods and as such require separate discussion. Yet, the data derived from these methods are not treated as isolated from each other rather they are viewed as intrinsically linked. Atkinson and Coffey explain;

Documents do not stand alone. They do not construct systems or domains of documentary reality as individual separate activities. Documents refer - however tangentially or at one removed - to other realities and domains. (Atkinson and Coffey 2004: 66)

They argue that documents do not construct isolated worlds rather they relate to other realities. It is asserted that there is a complex relationship between documents and the social worlds in which they are created and to which they refer. Within this research project, documents are treated as integral parts of the social world under scrutiny. They are conceived as playing an important role in the construction of that same reality which is represented in the interview data. The data derived from the document analysis have thus been utilised together with the interview data. That is to say, these two methods have not been practised as entirely distinct but have been used in conjunction with one another.

For example, the interviewees were asked about their knowledge of and views concerning documents that were identified as key through the research processes. The documents in turn acted as a source of information in identifying interview participants and becoming sufficiently aware of the technical language through which the issues under scrutiny are communicated. In these ways (and others) the use of interviews and document analysis together proved useful and successful in building up an understanding of the social concern of flooding. Interviewing and document analysis produce different kinds of data and thus more detailed discussion of documents as a form of data, as well as the combination of these different forms of data is required.

For the document analysis multiple secondary sources were collated and analysed for *what* they said and for a greater depth of knowledge about the topic area. Documents are understood to take many different forms it is thus worth distinguishing the type of documents analysed in this research. Lincoln and Guba (1985) distinguish between formal 'records' (marriage certificates, policy white papers, contracts and so forth) and personal 'documents' (diaries, memo's, letters and so on). The documents employed for analysis here would, according to Lincoln and Guba's terminology, be classified as formal 'reports'. The full range of documentation and secondary textual materials utilised in the thesis are referenced in the bibliography; below a description of the types of sources used provides a broad but good indication of the documentation materials analysed.

- Government reports and consultation documents from, for example, the Department for Environment, Food and Rural Affairs [DEFRA], the Environment Agency [EA] and the Office of the Deputy Prime Minister [ODPM]
- Government strategies and policy outlines for flooding and climate change for example those published by DEFRA, the Ministry of Agriculture, Fisheries and Food [MAFF], the Welsh Office [WO] and the Welsh Assembly Government [WAG].
- Select committee reports, such as the House of Commons Agriculture Select Committee (1998 and 2001) and the House of Commons Environment, Food and Rural Affairs Select Committee (2004)
- Planning guidance such as Public Policy Guidance Note 25 and Public Policy Statement 25
- Historical texts and study reports from various different organisations with involvement in flooding issues e.g. Association of British Insurers [ABI], DEFRA and so forth
- Official website pages of numerous organisations (e.g. ABI, National Flood Forum [NFF], Country Land and Business Association), institutions (e.g. EA), government departments (e.g. DEFRA, ODPM) charities and Non Governmental Organisations (NGO) [e.g. WWF, Greenpeace].
- Scientific Reports, such as *Foresight: Future Flooding* (Evans et al 2004)

The vast majority of the documents analysed as part of this study did not show visible human agencies in their creation, that is, no social recognition of authorship was apparent in most of the documents. There was an implied ownership for many of the documents, for example, the originating institution(s) was identified on the front or inside the document. Indeed, it is the indications of ownership, or more specifically the institution to which the publication was attributed, which have been utilised to reference the documents. The personal agency of the individuals which were involved in creating the documents was, more often than not, excluded and not explicitly identified.

The documents were purposively selected, depending on their relevance to flood issues. As noted, the analysis of the documents was carried out along side the analysis of the interview data. In addition, the documents themselves have been viewed as connected and inter-related. The process of collating relevant documents was informed by the links between documents. Documents refer to other documents and thus a trail is in part created between documents. The collection of the documentation then was in part a product of following these reference trails - this might be understood as a 'snowballing' technique of sampling (Becker 1969). For example, in the policy document *Making Space for Water*, other documents such as the *House of Commons Environment, Food and Rural Affairs Committee Report on Climate Change Water Security and Flooding* are referred to. These documents were subsequently analysed.

In following this trail, light was shed upon the substantive concern under scrutiny but also on the wider social and policy context within which the documents pertaining to flooding were created. Flows between documents were evident with each text contributing to the constitution of the issues. For example, the Government's document on sustainability, *Securing the Future*, fed into the policy document for flood management, as did the scientific document *Foresight: Future Flooding*. These flows are evident not just in the referencing of other documents within documents but also in the rhetoric and proposals. *Making Space for Water*, for example, provides a long term vision in line with the proposals in the foresight report on future flooding and advocates sustainability as it is constituted in *Securing the Future*. Atkinson and Coffey (2004: 68) refer to the notion of 'intertextuality', drawn from literary criticism,

to explain this notion that texts are not freestanding but rather, no matter how implicitly, refer to other texts.

The study here does not involve a detailed study of the production and uses of documents which flow through and around the organisations selected for study. Instead, a number of documents produced by the organisations and institutions have been utilised in furthering understanding of the social issue of flooding and the way that it is understood, tackled, and approached in contemporary England and Wales. It is asserted that the documents studied formed an integral part of the discourses through which flooding is understood and constructed. The documents and the notions contained therein were apparent explicitly in the discussions with participants and at the events attended. At points in the research the document analysis formed a point of departure for research (as with the foresight report on flooding), while at other times documents were analysed to follow up on areas which arose as important in the data (such as the DEFRA point scoring system for allocation of flood defence).

The documentation of differing forms featured as an important part of the construction and reconstruction of the issue. The documents are in some respects relatively stable but their 'presence' and significance is created through the much more fluid actions and discussions of individuals involved in the fields. As such, while the documents appear to be imbued with power to a certain extent, shaping the discourse and decisions taken, they can also be and are negotiated and contested through the actions of those in the field. For example, the DEFRA points scoring system constitutes a written document which to a large extent determines the allocation of funding for flood defences. However, one participant described the processes through which a local area negotiated its place as a trial site for a new flood defence technology, achieving the allocation of flood defences despite not having achieved the necessary points.

Documents are viewed as important in the settings for that which they communicate, but these communications are also conceived as negotiated, constituted and reconstituted through actions in the wider settings and social processes of which they are part. They are not viewed as transparent representations of decision-making procedures, conceptions of the issue, or actions towards an issue. The particular kinds

of representations which they construct, depending on their own conventions, are borne in mind. The documents are treated as involving a particular documentary version of reality which interacts with the social world.

For example, *Making Space for Water: The Government First Response*, one of the key documents analysed here, was created as a policy document and released directly before the 2005 election. The creation and release of the document is conceived here as contingent upon wider social events, such as the prior flooding events in 1998 and 2000 and the upcoming 2005 election. The document itself has 'been circulated' in policy institutions and while its impacts with regard to practice may be more limited, its impact in the discourse which surrounds the issue and the nascent understandings of flooding has been highly significant.

The production and consumption of the key documents utilised herein were thus scrutinised as part of the wider social setting. The documents were not viewed as transparent representations of organisation routines or decision-making processes. Instead, they were understood as important data which should be regarded and treated critically just as the interview data were. They were not used to support or validate other forms of data instead they were treated as significant data in their own right and were utilised alongside and with the other forms of data to provide a picture of what is termed here as the 'dominant' conception of the issue. They are understood throughout as important interactive elements of the social settings through which flooding is constituted as a social issue. In their interaction with the social world documents hold an important capacity, communicating rules, guidelines, ideas and ideologies, and in this case, can communicate social problems in particular ways, acting in the framing of issues. They are however, always negotiated, in their conception, in their reading and rereading, in the discussion of the content, and in the disputing of decisions taken utilising their contents.

In summation, documents are understood as having a role in the construction of the social world and as being situated within complex flows between other documents and between the social worlds of which they are part. They are conceived as important parts of the social world and thus warrant attention in research projects. The content of the documents analysed has been the primary focus herein. Never-the-less

consideration has been given throughout to the production of the documents, the inter-relations between the documents themselves and the social world in which they are constituted and which they in turn construct, as well as to the specific types of documents which have been the subject of scrutiny. In addition, the reading of the documents is construed as an active process, to which this researcher has brought their specific knowledge(s), ignorance(s) and personal biography. The analysis has thus been conducted with a reflexive awareness. The observation work has formed an important part of the research. The focus now moves to discussion of the process of observation and the data derived from this method, as well as the use to which such data have been put in the analysis.

### *Observation as Context*

In addition to the analysis of documents and the interviews, observation work also formed an important part of the research process. With regard to observations and interviewing Atkinson, Coffey and Delamont (2003: 106) identify the comparison as revolving 'around the ironic contrast between what people do and what people say they do'. The assertion has been made that there is a difference between what people say they do and what they actually do and that, in this respect, participant observation can be utilised to correct any inaccurate accounts derived from interviews. This understanding of methods is critiqued as entailing assumptions regarding research and data which appear naïve in light of more recent debates about the complexities of accounts, actions and interpretations (Atkinson, Coffey and Delamont 2003). Atkinson et al (2003) explain that such notions entail the privileging of one method over another as a means of achieving knowledge about the social world.

They propose that there is a need to 'divorce the use of the interview from the myth of inferiority' (Atkinson et al 2003: 108). In contrast, interviews should be viewed as equally valid ways of capturing shared cultural understandings and enactments of the social world. This is not intended to privilege interviewing over observation rather the dichotomy between the two methods is dissolved as both the observed and the narrated should be treated as forms of social action. This allows a capacity to move beyond simple articulations of differences between observed actions and accounts about actions. The combination of observation and interviews in this research is



viewed in such terms. Rather than being seen as a way of checking the validity of data derived from different methods, both are viewed as forms of social action. The various methods utilised in this study are seen to produce different data but all are seen as equally significant for the capacities they provide in achieving knowledge about a social world. The greater use of the interview data in the ensuing discussion should not be seen as a preference for that form of data nor for the method itself. All the methods, utilised for this research, have been significant in informing the assertions and conclusions drawn in the thesis.

The observation data collection was primarily achieved by attending events convened on the issue of flooding (and also climate change). There were however, opportunities for what might be classified as 'observation data', during the face to face interviews. Further, at interviews other material was often provided by interviewees, which formed data additional to the interview transcripts. This extra data sometimes took the form of documents that might otherwise not have been available, pictures or diagrams drawn by the interviewees to explain examples or experiences, and tours of offices or buildings to show how different sectors/parts interacted or were divided up. All these other forms of data, including discussions after the recording equipment had been turned off, were written up as field notes. These data have provided insights that may otherwise not have been possible and have been useful in achieving a better understanding of the social concern being addressed here. The observation data has been of significant importance in providing a contextual understanding in the research.

The actual events attended have been divided into three broad categories, these are; conferences convened around the issue of flooding, including two large, national annual conferences, as well as smaller conferences; board meetings (open to the public) and stakeholder meetings; and site visits, such as to the Thames barrier. The data obtained from these events was written up as field notes. The final form of the field notes, as they were written up for analysis, was a composition of hand written notes taken during the events from observation and discussions, and copies of papers, conference proceedings and informative material obtained at the events.

This observation data has not been directly analysed but instead has provided a more general contextual basis for the analysis, providing insights which the interview data did not necessarily yield, or pointing to emphases that may have been missed if the research had relied on interview and document data alone i.e. points that appeared minor in the interview data only came to be seen as a salient when viewed in conjunction with the knowledge derived from observation work. The decision not to conduct a detailed analysis of the observation data was made in the process of refining the data to make a considered and detailed analysis more manageable within the given constraints (e.g. time). Silverman (2000) highlights this process of narrowing the analysis through selection of data as an essential part of the research process.

Despite there having been only limited direct analysis of the observation data it has formed an important and integral part of the research process and has been significant in informing the research at a more general level. Angrosino and May de Perez (2000) have highlighted the significance of observation for research in the social and behavioural sciences. They note the importance of the observational work in interview contexts and in settings that are the 'natural' loci of activities. This notion of a natural setting requires clarification for the purposes here and it is deemed to refer to any setting which has not been purposely contrived by the researcher themselves for the purpose of data of collection. It should be noted that this notion of the natural setting, which permeates the literature on observation, is not understood in essentialist terms. Rather, the social world and thus all settings are considered contrived or constructed in some sense.

In line with the epistemological position discussed in relation to the other methods the researcher is regarded as active in the construction of the meanings through which the observational setting is achieved and understood. The traditional approaches to observation work assumed the researchers capacity to objectively observe that which they viewed. There was a focus on either minimising their impact upon the 'natural' setting or, in contrast, on submerging themselves in the setting so that they might better understand the meanings of those they were studying. Even those that aimed for submersion in the setting still claimed to be able to maintain their scientific objectivity.

Angrosino and May de Perez (2000) explain that failure to maintain objectivity was considered to be 'going native' and rendered findings suspect as scientific data. This conception of the researcher as holding some capacity to achieve objectivity has been critiqued and questioned. As noted earlier, various developments in theory (e.g. often termed post modernism and post structuralism; as well as developments in the philosophy of science) have been associated with this 'turn' in the social sciences. This 'turn' might be crudely described as relating to the question of whether it is both possible and desirable to describe or interpret cultures as if those depictions could exist without the ethnographer being part of the action.

The position here has been established as one that accepts the critical conceptions of knowledge as actively and subjectively created but maintains some notion of an existing reality (albeit a constructed one). It is asserted that the capacity for objectivity in the conventional sense is not in actuality possible as the researcher is always placing subjective interpretations upon their data and being active in constructing the social world which they study. It follows then that if objectivity is not fully achievable and all research involves a degree of subjectivity, to remain consciously aware of this and make it to some extent transparent does nothing to diminish the research. These arguments have been rehearsed earlier but in relation to observation work they have particular implications.

Angrosino and May de Perez (2000) characterise this shift in relation to observation work as a movement from observation-as-method to observation-as-context. They use this terminology to describe the increased desirability of researcher immersion in the culture being studied. The observation work here was conducted with a view that the researcher inevitably has a role in the settings, a position that might be construed as 'active-member research' (Angrosino and May de Perez 2000: 677). There was no attempt at non-participation - indeed some of the events attended required active participation – as this would not, according to the view here, result in the achievement of better data. Neither was there a concern with 'going native' since this too is less problematic if the researcher has no desire to assert the knowledge produced as 'objective' - as is the case here. The actual act of observation meant that there was less involvement on the part of the researcher than perhaps might have been otherwise, since the taking of notes and developing knowledge hindered participation. The

conversations which were an important part of the usefulness of the observation work are construed as co-constructive processes, which inevitably require the researcher's participation.

The notion of harmonising observer views with participants' or 'insider' views to achieve some sort of 'ethnographic truth' is not considered to be feasible. The participants are construed as collaborative partners or co-producers of the knowledge which emerges. This view is tempered with the assertion that the researchers' own views, biographies and subjective interpretations are likely to play a more significant role in the knowledge creation than the participants do themselves. This research is imbued with these contemporary sociological concerns but as has been stated, the focus for the research has been primarily upon that which has been produced through the research processes, with an acknowledgement of these epistemological ideas, rather than upon the processes themselves.

The research role was not as problematic for this research project as it might be for studies of communities or settings that are less likely to come into contact with researchers, social or otherwise. For example, Angrosino and May de Perez (2000) discuss Angrosino's (1992) study of adults with mental illnesses or learning difficulties, explaining that it was necessary for him to establish a 'role' in the community for his research purposes. Indeed, there are multiple studies where the difficulties of entering the 'field' are discussed (Roy 1999). In the case of this research the observation settings were attuned to the notion of researchers, particularly in the conferences attended. The conference events although not academic *per se* - since they were primarily dominated by policy makers, professionals, engineers and practitioners of varying kinds - entailed a familiar format of papers being given, followed by questions. Discussion about issues of interest took place during tea breaks, allowing the researcher the opportunity to ask questions in more informal circumstance. Significantly, it was not unusual for a researcher to be present at such events.

The only difficulty encountered was in the process of situating oneself as a *social* researcher conducting exploratory research. This was of relative inconsequence, however, and on the whole individuals were familiar with social research and thus

affirmed the researcher's role in the settings. In addition, to these kinds of events the meetings attended were open to the public in line with the Government's aims of 'transparency'; access was therefore easily attained and there were often other academics present in the audience at such meetings. Despite this researcher's unfamiliarity with the research issue, the settings were not dramatically unlike those encountered in academia and thus it was possible to gain entry with relative ease since knowledge was already held with regard to conventions for behaviour in such settings. As it was the issue, rather than the setting, that was of primary interest, this familiarity with the settings was a useful aspect of the site choices for observation work; that which was the object of study was 'strange' but the settings were familiar.

There were of course other concerns that were not the product of being a researcher but rather of being a young woman. The events attended were all male dominated and indeed the gendered nature of this social world was encountered most prominently through the observation work. In addition, this researcher was at many events one of the younger attendees and thus age was also factor. These issues have not been the subject of analysis *per se* but have been regarded as of importance with regard to the data. The significance of these issues has been discussed in relation to the interview data and it is not necessary to rehearse those arguments here. It is worth noting that identity is understood here as fluid and establishing identity in the settings might be best explained in Walters (1996: 63) terms as 'pivoting the centre'; continually establishing an identity congruent with the social world under study and with one's own perceived identity.

The relative ease in situating oneself in the setting was in part, a fortunate outcome of the chosen research area and in part a pragmatic decision. The observation settings could have been a particular place of work or a specific site where a flood management scheme was being implemented, for example. However, the aim of the research was to gain a more generic insight into the processes through which flood management is achieved and a broad understanding of the issues as they are represented by those working in relation to flood issues. In addition, the processes through which a scheme comes to fruition are often very drawn out, stretching beyond the time allocated for this project and while interesting insights could still have been gained, it represented a less practical choice in terms of addressing the research

questions, gaining access, achieving breadth of understanding and in relation to time allocated for the project.

Angrosino and May de Perez (2000: 681) point out that for many researchers the 'cultural object of study' may not be fully accessible within a particular site. This was the case for this research project as the desire to learn about differing understandings within varying organisation and institutions meant that the research did not lend itself well to the study of one particular setting. The issue of interest here is not constituted as a social concern in any one specific setting or by one particular group. The social processes of defining flooding as a problem are viewed as much more fluid and as occurring through interactions and flows between different people, organisations, institutions, and documentation.

The community of interest is that which has arisen through the connections with the socio-environmental issue of flooding and related theme of climate change; there is then no one site which unites the object of study but rather the community is formed around the issue itself. In some senses the creation of the community being studied for the purposes of this research has been a collaborative experience between the researcher and the participants. The choices that have been taken throughout the research, with regard to sampling for example, have defined the researcher's role in the formation of this community, while the interviewees contributed through recommending people for interview and describing connections, relationships and experiences.

In summation, observation work has in the past been understood as a data collection technique whereby researchers were assumed to have the ability to objectively observe the settings which they studied. In contemporary social science, the setting has come to be viewed as 'context' and the researcher's role as involving a process of continually defining themselves as members of those settings. In addition, the researcher is seen as playing an interactive role in creating the setting with other individuals in the locales. In this research project, this way of understanding observation is significant in how the data obtained is viewed. The data, and the finished written work, should be seen as intimately connected to the researcher themselves and be understood as reflecting both participant views and knowledge of a

social world, as well as the researcher's own values, biography, choices, interpretation, and role in constructing the data and research narrative.

Each of the methods employed for this research project have been the subject of discussion. Ontological and epistemological considerations have informed and been discussed throughout this treatment of the methods. The understanding herein of the data these methods produce has been delineated. The particular capacities that the chosen approaches to research allow for gaining knowledge of the social world have been critically reviewed and the position here established. The analytical processes are implicated in the discussion but thus far have not been made explicit. It is to the analytical approach that the focus now turns. Many of the conceptual issues with regards to analysis have already been discussed but the descriptions of what was done have not yet been provided.

### **Analytical Approach and Concerns**

Questions of analysis are implicated in the discussion above as they relate to epistemology, the understanding of the data and the use of the notions of discourse and framings as means for discussing the subjective ordering of the world. This section now makes explicit the chosen approach to analysis and entails a description of the process itself. An iterative process of analysis is key to reflexivity and as such there was no one stage of analysis in this research project. The analysis involved a continual process of reflection and thought which developed throughout the research and the writing.

Analysis began with initial thoughts, observations and impressions derived through conducting the research. The analytic ideas were in this sense slowly formulated over time and during the research. At another level the analysis was achieved through reading the texts produced from the interviews and observation, as well as the documents and, perhaps most significantly, through the writing. There have been several stages of writing, beginning with initial papers and progressing into long written documents before ever finding form as chapters. Through this process

theoretical literature has also been read and re-read, and has informed the analysis throughout.

Once the analysis began to find form as chapters a story of this social issue and of the wider social world was created from the data. This story was not fully clear until the writing of the document was completed. Indeed, deciding on the order of chapters represented a particular stage of analysis whereby the storyline was decided upon. Writing then is construed not as 'a mopping-up activity at the end of a research project' but as 'a way of knowing - a method of discovery and analysis' (Richardson 2000: 923). Writing is not viewed as an unproblematic activity which results in a transparent account of the world studied, but rather as a method.

In viewing writing as method 'we experience "language-in-use", how we "word [and reword] the world" into existence' (Richardson 2000: 923). It is asserted here, in line with Richardson, that this worded world never accurately captures the studied world but in understanding writing as method, the practice of 'trying' to do so is honoured and encouraged. Writing is construed here, and indeed has been utilised, as a dynamic and creative process. The analysis has in large part been achieved through the writing. The story told has emerged as the writing has progressed and has thus involved a constant process of revision, reading and re-reading of data, and the taking of decisions regarding the construction of coherence.

There were in some senses 'themes' which were slowly drawn from the data. At points in the analysis the data were copied as extracts and organised into separate word files. These files were labelled risk, economics, nature/culture and climate change<sup>10</sup>. In the writing processes however, these word documents when utilised were frequently found to not contain the particular piece of data which the researcher sought and had remembered as significant or salient to a particular argument from memory. This frustrating re-occurrence thus required that the original interview transcripts were repeatedly revisited for re-reading and for the extraction of pieces of data which were found in memory but not in the previously organised data sets. This

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<sup>10</sup> These are examples, there were several other categories but these were subsumed in the wider themes identified.



process of revisiting was also important as the researcher was never far away from the original less fragmented narratives contained in the interview transcripts.

Data extracts that were remembered in a particular way were read in their original context forcing repeated revisions of interpretations and assertions. The intimate knowledge and memory of the data which the researcher held prevented any straight forward 'coding'. The process of returning to the data sources also forced the recognition that data did not easily allow categorisation. Indeed, important data were often found to not have been included in the initially categorised documents, as shifts in the interpretation of which data were salient changed over time as the writing and analysis progressed. This observation has implications for how categorisation processes are conceived with potentially significant difficulties being identified in such an approach. The disadvantages of categorisation in research are already well documented (Atkinson 1992) and it would be difficult to suggest an alternative *practical* approach to analysis without some form of thematic ordering of data.

The process of achieving this 'story' has not been as systematic as it might plausibly be represented, should the author so choose. It has, however, been thorough. Indeed, to some extent, clearly defined systemisation of the analysis has been sacrificed in favour of thoroughness. The data and the interpretation of the data have been treated with a conscious critical awareness on the part of the researcher. This self-critique of the interpretation has been further enforced through the constant re-reading of the data. From this process the researcher has learnt of the ease with which that which does not 'fit' can be excluded without intention when constructing a story. There has been no such 'ease' in this analysis as the revisiting of the data which has been constant throughout the process, has repeatedly thwarted any such tendencies. This means of achieving analysis and delivering an interpretive report from the data has heightened the rigour of the research and increased, what might be thought of as, validity.

There has thus been a constant movement between theory, analysis and data which permeated the entire research. This may appear as having been influenced by grounded theory proposed by Glasner and Strauss (1967) and certainly this approach to qualitative research has born some influence on the approach adopted here.

However, the systematised understanding of the stages of data collection and subsequent saturation which informs grounded theory has not been taken up. Thus, the specific requirements of a grounded theory approach were not followed in this analysis. There is only a noted similarity between the analytic approach in this thesis and that of Glasner and Strauss' (1967) which hinges on a belief in the importance of constant flows between data collection, analysis (involving writing), and theory use and development.

Charmaz (2000: 510) delineates a 'constructivist grounded theory' that is more closely aligned with the analytical approach here. She explains that this form of grounded theory can encompass 'the relativism of multiple realities, recognise the mutual creation of knowledge by the viewer and the viewed... [and the] interpretive understanding of subjects' meanings' (ibid.). Charmaz (2000) asserts that the power of grounded theory lies in its tools for understanding empirical worlds. She argues that these tools can be reclaimed from their positivist underpinnings to form a revised more open-ended practice of grounded theory that stresses its emergent, constructivist elements. It is an interpretation of grounded theory which sits more comfortably with this researcher's views and which has informed the analytic approach.

The analysis has been achieved through processes of continual thought and interpretation throughout the research. Implicated in this are the writing of the thesis (comprised of multiple stages of writing and (re-)construction of the arguments herein); constant reading and revisiting of (primarily) sociological theoretical works which constituted a lens through which to view the data; and perpetual engagement with the data themselves. It is asserted that this approach to the creation of knowledge provides the reader with a considered and rigorous interpretation or story of the social issue which has been the subject of scrutiny. This thesis is positioned as only one account which is clearly contingent upon this researchers own values and biography (including academic preferences) but is held as a valuable piece of knowledge which could be situated amongst multiple other knowledge(s) about this issue and the concerns addressed herein.

The ethical considerations associated with this project relate most prominently to securing the anonymity of the participants and ensuring confidentiality. Anonymity is held to pose particular problems for analysis of qualitative data in the context of interviewing key figures in relatively close networks. More generally, additional concerns relating to the potential implications of the research, informed consent and accurate representation have also been given consideration during the research. The discussion of ethical concerns and their implications for analysis requires situating in the wider context of ethical practices. Thus, before continuing with this discussion the author's view of ethics more generally is briefly delineated.

Ethical guidelines concerning confidentiality, anonymity and privacy are outlined in the statements of ethical practice produced by the American Sociological Association, The Association of Social Anthropologists and the Social Research Association. These guidelines have been endorsed by the British Sociological Association and have been adhered to in this project. Burgess (1984: 193) asserts, however, that ethical statements often 'do not come to terms with the relations between researcher and researched'. He suggests that there are often hurdles which are not covered within ethical guidelines. In line with Burgess (1984) it is thus held that the process of ethical consideration necessitates awareness on the part of the researcher which extends beyond knowledge of and adherence to the statements of ethical practice.

A departmental ethics application was given approval for this research. The view of ethics taken here is, however, a dynamic one, whereby ethical consideration is conceived as a continual process of awareness throughout the research project. Standard procedures for ethical approval embodied in the 'ethics application' have been queried as projecting a view of ethics as a preliminary consideration before research takes place, which can then be relegated to a background concern once approval has been granted. In contrast, in this thesis ethics are seen as an important part of the research process whereby ethical issues are considered throughout (Cannella and Lincoln 2007). The most prominent ethical concern that has arisen for this research project has been in securing anonymity for the participants. As such this particular ethical concern is treated to some detailed discussion.

As highlighted above, securing anonymity in this research has had implications for the analysis and the resulting treatise. It has posed particular problems in this research because of the type of participants involved. The participants, as noted, were 'key actors' within the field of enquiry holding high level positions within various organisations that have involvement with these issues. The networks of people at this level were relatively small and interconnected and participants have knowledge of each other's roles and perspectives on some issues. As such, there were additional concerns in securing anonymity. It was necessary to consider whether the participants could be identified from what they had said, in a more general way, rather than just in those places where they specifically mentioned their role, name, or position. For example, if a participant spoke about a particular occurrence or discussed their knowledge in relation to an issue it may have been possible to identify the participant through knowing that only the person in that role would have that knowledge. However, these issues with regard to anonymity were not only ethical concerns but also had significant implications for the data analysis.

A particular difficulty was that the participants were selected for their central and high level roles in relation to flooding. Their position at the time of interviewing and longevity in working in relation to flooding or climate change impacts is regarded as significant in relation to the data. Their perspectives, knowledge(s) and understandings have been regarded as providing insights which can be generalised further with regards to their institutions and the social world that exists in relation to flooding. The integrity of the data is thus intimately connected to the roles that these individuals hold and thus their authority as 'key' actors, with significant knowledge and understanding of the issues grounded in long-term experience in the field. For this research, not just what was said but also who said it was significant. However, the links between who has said what, and indeed the exposure of who has taken part is an important ethical omission. The participant roles as noted cannot be identified and thus the claims made herein rely to some extent upon trust and belief in the researcher. However, this of course, is true to some extent for all elements of research when, in line with the arguments here, research is conceived as intimately connected to the researcher themselves.

A further issue arose in identifying the institutions to which the participants were affiliated. Again this was a key concern with regard to the data and claims. As the participants were delivering their views, rather than the views of their institution, utilising this information as an identifying feature was also not possible. The use of disclaimers (i.e. 'the views here are the views of individuals and not those of the institutions in which they work'), were regarded as insufficient, as it is felt to be likely that the narratives would have been identified with the organisations if the name were written next to it regardless of intention. In addition, some of the participants would be easily identifiable if the information concerning which organisation they worked within was given.

The variation in institutions and organisations from which the participants came were important aspects of the research design. The research was designed to achieve insights from a range of stakeholder organisations with the aim of gaining understanding(s) of the issues from different perspectives. There were thus significant problems in finding meaningful ways of allocating the participants' identities necessary for analysis. In an effort to diminish the problems of anonymity, but maintain the capacity for analysis, broad categories were determined. These are political, insurance, scientific, consultant, independent organisation, policy-planning professional, engineer and academic. It is important that these roles are clarified further but the extent of elucidation has to remain within the bounds of anonymity and confidentiality.

*Political* (Pol.) is utilised to refer to those participants that have a role which is within an organisation with some direct political affiliation or policy role (an individual working within a government department or affiliated institution, for example, would be classified as such). *Insurance* (Ins.) refers to participants working in an organisation which has a role in relation to the insurance industry (any insurance company or independent body affiliated with the insurance industry would come under this category). *Scientific* is used in referring to participants which are natural scientists, working within scientific research bodies. *Consultant* (Cons.) refers to interviewees that worked as independent consultants in relation to flooding or climate change concerns. Their specific consultancy skills will be elucidated as far as is possible with the constraints of anonymity. *Independent Organisation* (In.Org) is a

category for those participants working in organisations that were independent not-for-profit associations. *Policy-planning professional* (P.PI) is relatively self-evident and refers to individuals working in planning policy. Finally, *Engineer* (Eng.) and *Academic* (Acad.), as categories, are also self explanatory, referring to career engineers and career academics respectively. The abbreviations in brackets are utilised throughout the thesis to identify participants as belonging to a particular classification.

The participants do not, as might be expected, fit neatly into these categorisations but their positioning has been decided based upon which term best describes their primary role. Thus, some of those actors that work within an organisation tagged as political may also be engineers, equally those labelled as academic may have a scientific or engineering background and so forth. Indeed, as noted earlier many individuals have held a multitude of different positions related to flooding over their careers. Therefore, an individual who is now a consultant may for example, have previously worked for a politically affiliated institution, and have been an academic before that. This illustration is entirely hypothetical but comparable career shifts are true for some of the participants. These categories are thus limiting in their descriptive capacity but are a necessary pragmatic device in avoiding the difficulties associated with anonymity when interviewing these types of social actors and in giving clarification for the purposes of analysis.

There are other notable difficulties which have been encountered due to this necessary ethical procedure of ensuring anonymity. It has been previously noted that the process of securing anonymity required consideration not just of identifying names and roles, but also of some of the general dialogue itself. This has had implications for the analytical and writing processes. It has to some extent required the telling of the story here in a different more deliberate manner. For example, in some instances participants knew each other and sometimes referred to or talked about another interviewee and/or their organisation. These overlapping dialogues could not be fully extrapolated and required omission. Thus, the picture of the social world painted here appears more abstracted from the networks and social connections through which it is formed than it actually was. The narratives often required fragmenting in instances where the participant described or explained things that would have made them

identifiable. This does not however detract in any significant way from the characterisation of the social problem under analysis here. Rather, it has had implications for the *way the story is told* not *what the story is*. The interesting, often contextual, data which could not be utilised has of course still informed the analysis and this researcher's understanding despite its omission from this written account.

The other ethical difficulties associated with the research project have been noted as relating to the potential implications of the research, informed consent and accurate representation. These issues although less prominent concerns than the issues associated with anonymity and confidentiality have been considered and addressed throughout this research project.

The implications of the research are obviously not determinable prior to completion and emergence in the social world. However, the researcher has been particularly aware of the difficulties encountered in taking a constructivist approach to environmental concerns. Frederick Buttel's approach to studying environmental issues is discussed in Hannigan (2006). Hannigan (2006: i) describes Buttel as having shifted away from social constructivism 'partly because he feared it would interfere with environmental reform'. These concerns have been discussed in more detail previously in the chapter, their mention here is to highlight that these issues have been treated as ethical and not merely conceptual. There are of course limitations with regard to anticipating interpretations (and misinterpretations) and thus implications. Clear and consistent presentation of the arguments can be held as tools in limiting these difficulties.

Accurate representation is regarded as extremely important but also as a significant difficulty for all research involving participants. The interview transcript represents a snap shot of a person's views which are understood here to be variable rather than stable. Thus, representing a person's interpretation and understanding of an issue poses difficulties beyond remaining true to the context of the original comment. There are strategies for ensuring greater accuracy, such as allowing participants to read and edit interview transcripts and/or involving participants in the analysis. The constraints of time both for this researcher and the participants were a significant factor in making any such process difficult in this project. The efforts with regard to this

concern have thus been focused upon ensuring that comments are interpreted with fidelity to the original context; that inconsistencies in transcripts are not hidden from view; and that interpretations are felt to be accurate. These efforts have been furthered most prominently through returning to the original transcripts throughout the writing and analytical processes - regarded here as intimately intertwined - thus remaining close to the data.

The final issue of informed consent presents greater difficulties for an exploratory study such as this than for perhaps more structured approaches to research. The participants were informed about the research topic. They were told that the research was a PhD within a sociology department and what their involvement would entail (length of interview, recording etc.) as well as the planned uses of the material. This information was given in the original request letter (see appendix) and verbally before the interview began. In addition, there were opportunities for the participants to ask any further questions both in the initial correspondence and throughout the interview itself. The only emergent difficulty encountered in satiating this ethical requirement was in communicating clearly the research purposes. The participants were often familiar with research and involved in the creation or use of research in their work and tended towards interpretations of the researcher's descriptions which were sometimes not congruent with the researcher's intention. This difficulty in communicating the research was not highly significant but at points more detailed conversations and discussions were required to give the participants a clearer insight into the research aims. Measures were taken, such as providing information at two stages and offering the opportunity for questions, to ensure that prior to the interviews the participants were fully informed and were happy about their involvement. This was sufficient in ensuring informed consent for the interview participants.

The approach to the ethical considerations outlined here has been one of continual awareness and constant reflection throughout the research process. Ethical standards and application procedures are regarded as an important part of ensuring ethical practice but as only one aspect of ethical practice. Ethical thought and practice is construed here as a process central to any research project. The issues that have arisen as most prominent during this project, and the tactics employed to minimise any concern they might raise, have been given attention here. There are of course other



ethical dimensions to research practice, regarding conduct in the field for example, which have been considered in the research but have not been given attention here for the sake of brevity. Overall, anonymity was of greatest significance with regards to ethics for this research. The interplay between ensuring anonymity and analysis presented significant challenges, raising some interesting dilemmas for research with 'elite' actors.

### **Concluding Remarks: Research as a Learning Experience**

Research is understood in this thesis as a means of learning and achieving knowledge. In the cases of sociology the concern is to provide knowledge of the social world(s). For social scientists questions relating to what constitutes knowledge have been at the forefront of methodological considerations for many years. It has been important in this chapter to clarify the author's understanding of the knowledge that has been derived from the data achieved through the particular methods. To this end the links between ontology, epistemology, methodology and method have been mapped (Henn et al 2006). It is held that the picture of the issue of flooding, and the social world sketched here, has been achieved *with* the participants, which are construed as active in constructing the issue of flooding and the social world that surrounds it on a daily basis.

The interview process is understood to involve the participant and researcher in an active process of narrative production (Holstein and Gubrium 2004). It has been asserted, drawing on Miller and Glassner (2004), that it remains possible to derive representations of the social world from interview data while maintaining this framework of understanding. This contention has been made more generically in relation to qualitative research. Drawing on Hammersley and Atkinson (1995) the capacity for research to produce knowledge of the social world, while adopting a constructivist view of both the social world and of research itself, has been asserted. In this thesis all knowledge derived from any research is conceived as partial and as intimately connected to the researcher that produces it but this is not seen to limit the worth or validity of that knowledge.

It is the contention here that this text should be read as one story of many which is intimately informed by the researcher's own views and interests as a sociologist, and more widely as a citizen and member of the social world she studied. There has, however, been a sustained effort to maintain a critical awareness of the researcher's role in this process and of the interpretations being made at every stage of the research. This text comprises a story which has been built around the narratives constructed through the interview processes and drawn from the documents. The observation work has provided a contextual backdrop for the analysis. The argument forwarded herein is that all research, all knowledge, is inevitably imbued with subjectivity; the researchers own socio-historic position and values are seen as deeply ingrained in research interpretation and knowledge creation. This has been eloquently asserted with regard to the social sciences by Weber (1904/1949) in his seminal essay *Objectivity in Social Science and Social Policy*, where he explains that subjectivity inevitably enters social research moreover, that this element is what is valuable<sup>11</sup>. He writes;

The personal element of a scientific work is what is really valuable in it, and that personality must be expressed in every work if it is to be justified. To be sure, without the investigators evaluative ideas, there would be no principle of selection of subject-matter and no meaningful knowledge of the concrete reality. (Weber 1904/1949: 82)

Research is held to entail the construction of a particular story through decisions, interpretations and constructions of narratives which are inevitably subjective and pertain to the particular researcher's historical trajectory and values. This understanding of research requires reflexive awareness and the subjectivities of the researcher to be made explicit so that the researchers view is not privileged over that of their participants. Such an understanding of research is not seen to detract from the capacity of the author to 'say something' about the social world.

The position taken here with regard ontology, epistemology, methodology and methods has been detailed in relation to on-going debates within the field of

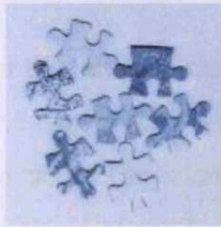
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<sup>11</sup> Weber's works on methodology should be differentiated from the position of latter writers and from the understanding taken up here. His work resonates with the claims relating to methodology here but Weber invokes a methodological innovation for maintaining some capacity for objectivity while the position here aligns with the notion that there is inherent subjectivity in the research activities and in method itself.

qualitative enquiry. This understanding of research has in part been achieved through the process of doing the PhD. In generic terms this doctoral project has been a lesson in research. Despite the training in and familiarity with carrying out less detailed studies, the PhD has presented a steep learning curve. It has been an experience for which no amount of grounding or advice could have prepared one. This may be in part due to what Hammerlsey and Atkinson (1995: 23) describe as 'the fact that such research [ethnographic] cannot be programmed, that its practice is replete with the unexpected'. They explain that this is due to research being a 'practical activity requiring the exercise of judgement in context; it is not a matter of simply following methodological rules' (ibid.). It is perhaps this feature of research, the experience necessary to exercise such judgement that eludes the novice researcher.

Indeed, there are many aspects that would have been addressed differently if this research project were embarked upon now with the benefit of hindsight and experience. For example, the researcher would have started the fieldwork earlier, as much of the early written work for this project was later disregarded once the data revealed a story to which that prior work did not apply. There are a multitude of other lessons and skills that have been gleaned from this research process. However, none of these could have been foreseen or indeed developed at all without this project. The research story told here is thus the polished result of a messier learning experience, not only with regard to the topic area but in reference to research practice itself.

This chapter has entailed a discussion of the methods utilised in this project and a positioning of the authors understanding of the data derived from them within the wider ontological and epistemological debates relating to methodology. Arguments relating to realism and constructivism have been touched upon with regard to epistemological issues. It should be clear that the author takes a constructivist approach to both the social world and the research process. The position thus entails an understanding of the social as constructed through the subjective interpretations that people place upon it. This position has a particular pertinence in relation to the study of socio-environmental issues which has been discussed. In the next chapter the theoretical literature utilised most prominently in the thesis is discussed and these works are positioned in line with the constructivist perspective delineated in this chapter.



## Chapter Three

### Of Conceptual Matters: Theoretical Underpinnings

Rethinking environmental issues in temporal terms gives us considerable theoretical and practical access to their complexity. (Adam 1998: 19)

#### Introduction

The assertions in this thesis are brought into focus through analyses of two important conceptual categories, those of time and risk. The risk literature is utilised for its relevance in addressing key themes arising from the analysis; i.e. the emergence of a more pervasive risk discourse in relation to flooding. Time theory has been drawn upon because of the facility it allows in understanding contemporary environmental issues. The temporal lens brings into view multiple aspects of importance for elucidating the processes of ecological degradation in industrial capitalist societies. There is an extensive theoretical and substantive literature which addresses or draws upon the conceptual notions of time and risk. This literature is such that there is no way of adequately addressing or reviewing the full body of works; indeed any attempt to do so could fill several books.

There has been an obvious necessity to narrow the focus with regard to the conceptual work that exists in relation to both risk and time. There were two initial decisions through which that utilised herein was selected. First, the sociological literature is the primary focus – although, works that might be classified as belonging to other disciplinary factions have also been drawn upon. Secondly, the sociological risk and time literature which has socio-environmental issues at its centre has been chosen. These decisions have been taken for the reasons that, with regard to the former, this author's background is in sociology and it is the sociological lens through which the data is being viewed. Regarding the latter, the decision was taken for the more

obvious relevance that those which take the environmental as their focus have for this particular topic.

In this thesis a range of authors and works are utilised in discussion and analysis of the data. These writer's views and arguments are sometimes complimentary but also in some cases contrasting. This chapter is primarily dedicated to an outline and analysis of the *key* authors whose work is applied in this thesis. The works of Beck (1992a; 1992b; 1994; 1996; 2000), Luhmann (1993) and Adam (1997; 1998; 2004) have all informed the analysis in this thesis in significant ways. Their analyses of risk and time have inspired and informed the arguments in this thesis to a greater degree than the works of other authors, the reasons for this are addressed in the following discussion. Their similarities and differences will be examined in more detail in this chapter, prior to the use of their differing conceptual ideas together later in the thesis. The conceptual differences between the key theorists are elucidated and briefly discussed in relation to the particular position in this treatise.

Various other authors' works have been drawn upon at points and will be briefly introduced here accordingly. Notably, the risk literature has been utilised more widely, this will be delineated briefly prior to the discussion of Beck's and Luhmann's theories of risk. The discussion that follows is divided into sections with each part entailing a treatment of conceptual matters which are of importance throughout the thesis. The sections are thus divided between a discussion of temporal theory and risk theory.

### **The Temporal Gaze**

Time theory has been utilised in this thesis as a particular way of seeing that is asserted to further conceptual understanding of environmental issues. Time as a category through which the social world can be understood is significant for attempts to analyse socio-environmental issues and the efforts to comprehend and tackle them. It allows a particular lens through which ingrained ways of doing can be viewed differently. The insights which can be derived from time theory have provided a way of viewing the discourses through which flooding is constructed as an issue. The understanding of flooding as risk and the relation of this emergent discourse to the

conception of flooding as a climate change impact, are examined later in the thesis in light of time theory and its connection with theories of risk (see chapter eight).

In this thesis there is a particular emphasis on the work of Adam (1997; 1998; 2004). Her co-authored treatise, *Future Matters: Marking, Making and Minding Futures For the 21<sup>st</sup> Century* (Adam and Groves 2007), has also been important in informing the doctoral work, although it is Adam's wider conceptual timescape perspective demarcated in her earlier publications which is the focus for now. These works have been drawn upon for the focus on environmental 'risk' from a sociological temporal perspective. There are of course many other writers that address the separate issues of temporality, environment and risk. It is in Adam's work that these are drawn together in ways that offered insight which resonated with the author's own understanding and the empirical data. In the context of this work Adam's time theory is drawn upon at various points as a way of viewing the discourses through which flooding is constituted as an issue. There is thus a need to provide an overview of Adam's timescape perspective (and briefly contextualise it in relation to work on time and environment more generally) as a backdrop to the subsequent selective use in relation to the analysis<sup>1</sup>.

In recent years, the time category has been applied specifically in furthering understanding of environmental issues (Hofmeister 1997; Held and Nutzinger 1998; Adam 1997; 1998; 2004; Adam and Groves 2007). Adam (1997; 1998; 2004) has developed an extensive body of work examining temporality from a sociological perspective, applying conceptual work on time to develop understanding of the social world. Adam (1998) argues that a focus on time facilitates a deeper understanding of socio-environmental issues. Nature, environment and sustainability are asserted as being 'not merely matters of space but fundamentally temporal realms, processes and concepts' (Adam 1998: 9). Their temporality is positioned not as simple and singular but as multi-dimensional. Adam suggests that knowledge of this temporal complexity is important in understanding and addressing ecological issues. She identifies

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<sup>1</sup> There is overlap between the work of Adam and Luhmann with regard to the temporal domain of the future and risk. The important aspects of this overlap relevant for the issues here will be elucidated in relation to the analysis later in the thesis. It is enough now to note that they both highlight the significance of risk for taming uncertainties in relation to the future.

assumptions with regard to time ingrained in the industrial capitalist way of life that stand in a problematic relationship to the contextual, irreversible temporalities of life and the multiple rhythmicities of nature. This relation is posited as implicated in the socio-cultural production of environmental hazards.

In this respect three key conceptual areas for examination are posited: 1) the complexity and interpenetration of rhythms i.e. cosmic, social, natural, 2) the imposition of industrial time on the rhythmicity of ecosystems; and 3) emphasis on materiality and quantity at the expense of that which is hidden from view and latent (Adam 1997). Adam is critical of these tendencies in industrial societies which are exposed when seen from a temporal perspective. As an alternative Adam offers a 'timescapes' perspective and suggests that this lens of vision relates to environment 'not as space, but as a record of reality-creating activity' (1997: 169). In positioning the environment as a timescape Adam notes conceptual advantages.

It allows us to recombine what science and the industrial way of life have set apart; phenomena and their creative processes, theory and practice, nature and culture, present action and its unintended impacts that continue to operate for an indefinite future. (Adam 1997: 169)

The timescape perspective is contrasted in Adam's analysis with 'industrial time'. Adam (1997: 171) identifies three basic tenets to which industrial time is structured: 1) 'the invariable beat of the clock, 2) the economic commodification of time and 3) the scientific use of time as a measure of abstract motion'. Adam explains that clock time is based on the principle of repetition without change and as such is distanced from the variable rhythms and contextual difference of living systems. Clock time, for Adam (ibid.), 'recasts time in atemporal form'. The permeation of clock time through contemporary industrial society leads to a tendency to 'lose sight' of the complexity of times in the environment and the body.

The time of economic exchange, as the second central feature of industrial time, is built on the principles that underpin clock time. Adam (1997: 172) explains how 'as abstract exchange value it translates the work of people and machines into money'. It thus depends on quantification and is, like clock time, at odds with the rhythmically constituted processes of ecological transactions and reproduction which are not easily

quantified. This makes translation into money difficult and undesirable as a means for encompassing environmental 'value'. Adam explains that;

In a world where money is synonymous with power, any time that cannot be given a monetary value is by definition associated with a lack of power and falls outside the value system of economic relations of production and consumption. The time of ecological give and take becomes subsumed under time consumption and generative temporality under the construction of permanence in artefacts and symbolic systems, products of science, institutions and market structures. (Adam 1997: 172)

Adam (1997) notes the significance of the time-money equation for economic practices. This conception brings with it a time value whereby speed is valued over processes that take a long time and over actions whose durations cannot be accurately estimated and calculated. Her work highlights how the economic approach to time tends to facilitate a strong present orientation and thus works against a long term perspective. This tendency is further exacerbated by the practice of economic discounting of the future, which means that 'the further into the future a potential gain occurs, the lower its value' (Adam 1997: 173). This constitutes an inbuilt tendency to value the present over the long-term future. Adam identifies 'out of sync timeframes' as closely connected to these trends. Here, she is referring to the lack of correspondence between the timescales of an action, its emergence as a symptom, its recognition as environmental hazard, and the responses to such a problem. In considering environmental hazards in these temporal terms it becomes possible to gain access to the complexities associated with these processes.

The time of laboratory science is the final aspect of industrial time which Adam discusses. In this she refers to 'time as a measure of motion' and posits that this conception of time is abstracted from context and postulated as reversible with respect to past and future. Adam explains how Prigogine and Stengers (1984) argue that the postulation of reversibility is based on the assumption that everything is given and that irrespective of the number of transformations a system undergoes, it could in principle be returned to its original condition. Adam posits a similarity here with ecological discourse, which is underpinned by ideas of returning the environment back to its original state. These expressions in environmental discourse for Adam reflect the permeation of the scientific world view in everyday life. Reversibility,



however, is in actuality not plausible as it implies the possibility of ‘unacting, unrelating, unknowing, unstructuring and growing younger’ (Adam 1997: 174). Reversibility in the context of environmental degradation is for Adam extremely problematic as it holds the implication that damage can be undone - this for Adam makes us more inclined to accept risks. She asserts, ‘recognition that all actions are unidirectional and thus constitutive of new and irreducibly different states and conditions, is thus an important precondition to environmentally cautious and precautionary action’ (ibid.).

A second, closely related, feature of the scientific approach to time is the physical sciences’ approach to nature. The predominant approach in science to studying nature in the laboratory means that its subject is ‘inevitably severed from its networked ecological context and the rhythmicity of life’ (1997: 174). Nature as it appears in the laboratory is thus, for Adam, abstracted from its temporal interconnections and contextual dependencies. This abstraction of nature entails wider implications for how nature is understood and treated. Once abstracted from context the processes of nature can be controlled, programmed, manipulated, and changed without full consideration of the implications. In addition, nature as resource can be made available at any time in readiness for use with no regard for the consequences of the decontextualisation of nature that this entails.

Adam concludes that clock time, economic time and scientific time together constitute industrial time. These three aspects of industrial time are held to ‘form a powerful conceptual bloc’, through which time is understood as a quantifiable resource open to manipulation and subject to use, allocation and control. Under these conceptual conditions emphasis is placed on visible materiality, upon the empirically observable, at the expense of that which is latent, immanent and hidden from view; that which is below the surface, unavailable to sensory perception is made inaccessible. This is viewed as a deep-rooted conceptual understanding which is inappropriate to the contemporary age where socio-environmental hazards are located outside the range of this particular conception.

Adam delineates the notion of a timescape perspective as a conceptual means to access differing temporalities and overcome dualistic tendencies in social science. She

highlights the excellent means that dualisms provide for 'setting boundaries for the phenomena under investigation' but suggests that they leave unaddressed 'the relation of discontinuity to continuity', i.e. continuity in light of fundamental change (Adam 2004: 150). The timescape perspective thus entails a move to focus on practices, temporal relations and engagement with processes and interdependencies, softening 'the edges of bounded relations' (id.: 151). Adam takes the notion of landscape and extends this concept to delineate the notion of a timescape perspective. She describes a landscape as a 'record of reality-generating activity' (Adam 1998: 54).

A landscape is a record of constitutive activity. It includes absences. It combines natural and cultural activities into a unified whole. It is relative to the eye of the beholder. As such, everyday understandings of landscape differ from images of nature of culture... defined negatively in relation to one another. (Adam 1998: 54)

Adam takes the notion of landscape and utilises it to formulate her conception of timescapes. A timescape perspective thus emphasises inclusiveness, connectivity and implication. It entails notions of integrating everyday knowledge with scientific knowledge and 'the constitutive cultural Self with the workings of nature' (Adam 1998: 55). The perspective then relates to epistemology, as it encompasses the notion that there 'is no innocent position from which to produce neutral knowledge, no objective realm from which to conduct acontextual investigations' (Adam 2004: 152). In relation to socio-environmental issues the timescape perspective allows differing temporalities to be seen and facilitates deeper understanding. Adam (1998: 56) explains that 'a timescape perspective conceives of the conflictual interpenetration of industrial and natural temporalities as an interactive and mutually constituting whole'. From this view contemporary socio-environmental issues can be seen to involve differing temporalities, distinguishing them as novel in their scale, degree and reach. In relation to flooding this perspective has provided a lens through which to view the contemporary understanding of the issues.

This perspective and Adam's assertions relating to the role of the industrial conception time have been important influences in this analysis. These conceptual ideas have informed the way the data has been viewed and analysed. Adam's analyses are far more detailed and wide-ranging than there has been room to discuss

here. This brief outline of some her notions regarding temporality and the environment will suffice for now as an introduction to the conceptual ideas which have been significant for the analysis. The theoretical concepts discussed and other elements of time theory will be introduced in more detail at various points in the thesis where they are employed in analyses.

As previously noted, there is an emerging body of literature that draws a connection between time and environmental issues, and wherein time has been highlighted as a category for understanding the emergence and continuing prevalence of environmental degradation. Adam (1998: vii) has collaborated with writers from different disciplinary backgrounds on a project called 'the *Tutzing Time Ecology Project*'. This involved several other authors who have contributed works in relation to time and environment that have made similar assertions to Adam with regards to western industrial societies temporalities and the continuing degradation of nature. Held and Nutzinger - writing from within economics - (1998: 209), for example, have pointed to the emergence of clock and calendar time and the following commoditisation of time as significant in enabling 'humans both to ignore the rhythms of nature and to attain the 'perpetual motion' and 'rest-lessness' of the non-stop society'.

Hofmeister (1997: 309) – an environmental geographer - depicts 'ecological policies and policies of time' as 'inseparable'. She explains how nature's productivity operates in times spans of hundreds, thousands and even millions of years, while human productivity is measured in single and double figures. For Hofmeister (1997: 310) then, 'the ecological question is also very much a question of time(s) as nature and civilisation do not share the same rhythms'. In congruence, the economist Biesecker (1998) argues that the economic approach to time damages the reproductive cycles of social life and the natural environment. She calls for the development of a new economy of time proposing the significance of this for addressing environmental concerns. Along with Adam, these authors are unified in their assertions by the notion that the neglect of the temporal dimension has 'hastened the environmental crisis to present proportions' (Kummerer 1996: 209). These other author's analyses, although interesting and pertinent, are not as detailed and extensive as that of Adam and thus did not offer *more* to this particular analysis.

A number of social scientists have dedicated works or parts of analysis to 'time', such that a comprehensive review of this literature could comprise a thesis in itself. Notably, Thrift (1983), Rifkin (1987), Giddens (1990), Harvey (1990), Elias (1992) and Nowotny (1994) are amongst those who have developed important analyses of temporality. These authors address time more widely, rather than taking socio-environmental issues as a particular focus, where they do address environmental problems their analysis are much less developed. This discussion has been limited to the broad notions within Adam's temporal theory in which time is delineated as a conceptual tool for gaining insight to *environmental* concerns, as it is these notions which have been most relevant for this thesis.

The focus here has been upon nature as a expressing a form of temporality and the disjuncture between natural rhythms and socially constituted time, as well as the problems associated economic and scientific conceptions of time. The discussion of time theory in this chapter is intended to give some broad insight into the ideas which have informed thought and analysis in this thesis. These notions are not given detailed attention elsewhere and it was thus deemed important to provide insight here into the conceptual perspective and ideas that have informed analytic content. The application of time theory has been important in informing understanding of risk. As such, ideas from within risk and time theories which link the two conceptually are important. The links between temporal theory and risk are examined in relation to the empirical topic in later chapters.

### **Theories of Risk**

The author had a prior background in elements of the sociological risk literature however, the focus on risk in this thesis developed in response to the characterisation or framing of flooding as 'risk'. The language of risk was found to permeate the discourse around flooding and was ever present in the interviews, discussions, and document analysis. It was evident that there was an increasing degree of 'risk talk' in relation to flooding and that (in institutional discourses at least) flooding was increasingly conceptualised in terms of risk (Power 2004: 9). As such, the exploration of the sociological risk literature was embarked upon in the hope that it might provide

some insight into why flooding has come to be perceived as 'risk' in modern society, and what it means for contemporary understandings of floods to conceptualise the issue in such terms.

Two major theoretical directions with regard to environmental risk have been identified, 'on the one hand, the critical theory of risk society and, on the other, the sceptical theory of the contingent society' (Strydom 2002: 36). Beck (1992a) can be identified as the key author associated with the former stance and Luhmann (1993) as the forerunner of the latter. Both of these theorist's works on risk are utilised to varying extents in this thesis to further the analysis of the empirical data. There are of course some strong differences between these theoretical works and the positions that underpin the arguments therein. However, they both provide insights which can assist in understanding 'risk' in the contemporary age. The broad insights they yield have been utilised in furthering understanding of the topic under consideration and the way it is defined and understood through the discourses. The identification of Beck and Luhmann as key authors in relation to risk does not mean the risk literature utilised in the thesis has been limited to these two theorists - quite the contrary - but their ideas, with their specific ecological focus, appeared to bear particular resonance with the data.

There are of course other major strands of risk theory which remain neglected even within these broad categorisations of theoretical directions. What might be termed the 'French governmentality approach' has not been utilised extensively in analysis for the reason that the works from this tradition appeared more sociologically narrow. Despite this, various authors that might be aligned with this tradition have been utilised here, particularly Ewald (1991), Castel (1991) and Rose (1999). The broad theoretical themes which Strydom provides for considering Beck's and Luhmann's approaches should not be considered as exclusive of the writers in this tradition either, since both Luhmann and Beck draw upon Ewald at various points in their analyses.

In addition, the cultural perspective associated most commonly with Douglas and Wildavsky (1983) finds some application here and again the more frequent use of Luhmann and Beck does not necessitate exclusion. Indeed, and as Strydom (2002: 53) notes, both Beck and Luhmann acknowledge the relevance of Douglas's cultural

perspective and take it up in different ways in their work, transforming Douglas's 'attachment to the psychology of perception and static structuralism'. Strydom (2002: 53) explains that where Douglas's approach represents 'a neo-classical tendency that is unable to transcend the familiar themes of the risk discourse, both Beck and Luhmann put forward post classical approaches that consider contemporary society in new ways'. Lupton (1999a) discusses a wide range of risk theories in her treatise providing an overview of the literature before aligning herself more closely with the cultural perspective, as such her work has also been drawn upon. The differences between the conceptual positions that underlie these works are left implicit herein so that the focus on the empirical subject of study might be retained<sup>2</sup>.

Beck's and Luhmann's work on risk in the contemporary age have more closely informed the analysis and have been important in shaping interpretation of the data. As explained in the methodology chapter the analysis in this thesis has involved a continual shifting between data and theory. In contradistinction, the works of other authors on risk have been useful at points but have not informed the analysis to the same extent as Beck and Luhmanns, which have been utilised for their explanatory power in relation to the emergent contemporary understanding of flooding. As noted, their works are drawn upon selectively for the purposes of analysis and thus the broader conceptual underpinnings of their respective theories require some unpacking before they are discussed in relation to the empirical aspects.

### *Delimiting the Object of Risk*

Luhmann's (1993) monograph *Risk: A Sociological Theory* is one of the texts utilised in this thesis both for the capacity it gives in illuminating the historical emergence of the risk concept and for its nuanced discussion of temporality. Luhmann's theoretical ideas have been rather selectively drawn upon for the utility of these particular elements of his writing. Luhmann's work on risk is situated within his wider systems theory, it is necessary to make it clear that this thesis is neither an extrapolation nor an application of systems theory. Rather, in the analysis Luhmann's delineation of risk is utilised in conjunction with other theoretical work so that the emergence of the

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<sup>2</sup> See Lupton (1999a) and Strydom (2002) for good overviews of the distinctions between theoretical traditions in risk.

modern concept of risk might be better understood. Luhmann's theoretical ideas as they relate to risk are employed for his insights into the significance of 'risk' for contemporary society. Luhmann's particular take on what 'society' is, or indeed his extensive arguments relating to the necessity to find 'a concept of society', a task which Luhmann conceives as neglected within sociology, are not addressed here.

This is potentially a difficulty, however, to enter into any detailed consideration of 'society' could quite easily constitute another (entirely different) thesis and is the subject of many other publications (see for example Outhwaite 2006). Luhmann's emphasis on the conceptual, and rejection of empirical, anthropological approaches is of course very difficult to reconcile with what is an empirically based thesis. Arguably however, Luhmann's concepts can be drawn upon without adhering to his wider theory (Schimank 1991 cited in Viskovatoff 1999). Viskovatoff outlines Schimank's position with regards to Luhmann's work explaining that it is possible to treat his conceptual works as a toolbox. He writes;

...his work can be treated as a toolbox, out of which one can take individual concepts and theorems depending on one's immediate goals, without having to worry about the rest of the theory. (Schimank 1991 in Viskovatoff 1999: 481).

Luhmann's discussion of risk resonated with the empirical data and thus has inspired conceptual analysis herein. It would seem inappropriate given the value of Luhmann's ideas in furthering the analytical thought to exclude them because of the difficulties in reconciling the implications of his wider conceptual underpinnings. They are left untreated here, however, in favour of an extrapolation of the empirical subject under examination; that is, the problem of flooding, its delineation in terms of climate change, the special role that risk plays in the discursive framing of the issue, as well as the implications that these framings have for means of and capacities for tackling flooding. Most significant for this thesis therefore, is an introduction to Luhmann's risk theory over and above his wider theory of society.

Luhmann's (1993) treatment of the concept of risk is complex and here it is only possible to provide a short summary. Luhmann's analysis of the risk concept leads him to note that it takes many forms. He begins his analysis focusing on the rationalist

traditional and critiquing the 'rational actor paradigm' assumed in risk (Renn, Jaegar, Rosa and Webler 2000: 46). Luhmann explains that this rationalist tradition contextualises the problem as being one of avoiding losses as far as possible with the proviso that since to follow this strategy of loss aversion too rigidly would restrict action too greatly, actions have to be permitted, that is 'risked', that could cause avoidable loss, if the estimate of that possible degree of loss appears acceptable. Risk is identified as 'a matter of controlled extension of rational action', as risks are calculated by multiplying the probability of loss by the degree of loss, or to put it another way, the probability is multiplied by the consequences. From this, Luhmann sees it as possible to assume that there are differing utilities and probabilistic distributions in regard to the consequences of different decisions; thus the decision itself can be described as risky in view of the different results.

Luhmann summarises that to abstain from risk would be to renounce rationality but he points to a sense of lingering unease. 'The rationalist tradition' Luhmann (1993: 14) writes 'has broadly been accused of not seeing what it does not see and "failing to take account of the blindness inherent in the way problems are formulated"'. For Luhmann, if the aim is to observe how the rationalist tradition observes, it is necessary to be free from its way of understanding of the problem. He suggests that it is necessary for the sociologist to shift to the level of, what he refers to as, 'second-order observation'. At the level of second-order observation he focuses his analysis of risk upon the two distinctions implied in the concept of risk; risk/security and risk/danger. For Luhmann (1993: 20) the risk/security distinction is inadequate, providing only 'an observation schema that in principle makes it possible to calculate all decisions from the point of view of the risk involved' as a result risk awareness is universalised. He asks; 'can there be situations where we can choose between risk and security, between risky and safe alternatives, or even whether we must choose between them?' (Luhmann 1993: 20).

Conceptually, this approach implies that apparently safe options provide a double certainty; that first, no loss will occur and secondly, that the opportunities made available through taking the risky variant will be lost. Luhmann asserts however, that this argument is deceptive as the opportunity that has been lost was never a certainty. 'It thus remains uncertain', as Luhmann (ibid.) puts it, 'whether by forgoing the



opportunity one has lost out on something or not; and what remains is an open question of whether one ought to regret preferring the 'safe' variant or not.' This question, Luhmann posits, will frequently be impossible to answer if the opportunity is not taken up at all, and the proceeding risk is not set in motion.

Luhmann (1993: 21) points out that once risks are taken into consideration every variant in a decision-making repertoire, or rather, every alternative is risky, even if that risk is only 'the risk of not grasping certain opportunities' that could prove advantageous. He identifies safety experts as first-order observers, that is, they believe in facts. Conflicts for them only arise over demands for 'more information, better information' or perhaps 'information being withheld by those who wish to prevent others from projecting other interpretations or making greater demands on an objectively given universe of facts – as though there were information available that one could have or not have' (Luhmann 1993: 21). Luhmann's first-order observer of risk takes this to be the real world.

Luhmann distinguishes second-order observation as the level of observation that the sociologist must take for viewing 'first-order observers'. The observer of his second-order is confronted with the problem that, what different observers consider as being the same thing, generates entirely different information for each of them. For Luhmann (1993: 21), this is not true though for the second-order observer who observes another to see what the latter can and cannot see. Now, Luhmann draws a further distinction between risk and danger. This distinction he suggests does 'justice to both levels of observation', that is second-order and first-order observation, as outlined above. The form of risk that denotes the other side of the concept as danger presupposes, Luhmann (1993: 21) states, 'that uncertainty exists in relation to future loss.' This assumption then offers two possibilities; Luhmann explains.

There are then two possibilities. The potential loss is either regarded as a consequence of the decision, that is to say, it is attributed to a decision. We then speak of risk- to be more exact the risk of a decision. Or the possible loss is considered to have been caused externally, that is to say, it is attributed to the environment. In this case we speak of danger. (Luhmann 1993: 22)

Luhmann has already pointed to the distinction between security and risk as a widely used binary. In the case of the risk/danger form of the concept of risk, however, Luhmann points to the insignificance of the role it has played in the literature. He (1993: 22) suggests that this may be in part attributable to the way that risk, danger and hazard are often used interchangeably 'in the largely English-language literature'. He concedes that there is a clear awareness of the role these distinctions play in perception and acceptance of risk, depending on 'whether we enter voluntarily or involuntarily into risky situations; or whether we believe that we have the consequences of our own behaviour under control or not' (ibid.). This however, Luhmann (1993: 22) asserts only describes variables that one 'assumes... to influence risk perception or the willingness to take risks'. In this respect the literature that deals with risk in this way is not concerned with determining the form of the risk concept which, Luhmann proposes, can only be done by determining the counter concept.

Luhmann (1993: 23) asserts that the risk/security and the risk/danger distinctions are constructed asymmetrically; that in both forms 'the risk concept indicates a complex state that, at least in modern society, is a normal aspect of life'. Luhmann goes on to assert;

The other side acts only as a reflexive concept with the function of elucidating the contingent nature of the states covered by the concept of risk. In the case of risk/security, this can be recognised in the problems posed by measurement; in the case of risk/danger in the fact that only in the case of risk does decision-making (that is to say contingency) play a role... if a risk is attributed to a decision, certain conditions must be satisfied, among which is the requirement that the alternatives [are] clearly distinguishable in respect to the possibility of loss occurring. (1993: 23)

In the schema of risk and danger the interest in security, or risk aversion, is still presupposed but is not "marked" - by marking Luhmann is referring to the means of directing attention to where the problem lies (Luhmann 1993: 24). The distinction of risk and danger, he suggests, permits a marking on both sides but not at the same time. Therefore, marking risks allows dangers to be forgotten, whereas marking dangers allows gains to be forgotten that could be earned if the risky decision were made. Luhmann suggests that in older societies, danger tends to be marked, while in modern societies the preference has been to mark risk, as the concern of optimising the exploitation of opportunity has been paramount.

The substitution of the risk/security schema for the risk/danger schema has for Luhmann an important advantage that he identifies as the use of the concept of attribution; that is, in the risk/danger schema risk is defined as a consequence of a decision and, therefore, the risk can be attributed to a particular decision. However, as Luhmann points out, the fact that the distinction of risk and danger is dependent on attribution does not mean that it is left to the whim of the observer to label something as a risk or a danger. Luhmann uses the example of damage to the environment, which is pertinent for the discussion to be presented here, pointing out that an environmental disaster is often not attributable to any particular individual decisions. Luhmann explains;

In the accumulation of the effects of decision making... in over complex and no longer traceable causal relations, there are conditions that can actuate considerable losses or damage without being attributable to decisions - although it is clear that without decisions having been made such detrimental effects would never have occurred. An attribution can be made to a decision only when a choice between alternatives is conceivable and appears to be reasonable. (1993: 26)

Luhmann's discussion of the risk concept thus far does not indicate a fact existing independently of whether and by whom it is observed, at the moment it remains open whether something is regarded a risk or as a danger. Therefore knowledge of which can only be gained through observing (second-order observer) the observer (first-order observer) and perhaps developing 'theories on the conditioning of his [the first-order observers] observing' (1993: 27).

In Luhmann's terms both danger and risk can be applied to every 'still uncertain loss'. Either risk or danger could be applied to the possibility that a flood could destroy houses and kill people. In the case of flooding every loss could be avoided by making a decision, thus classifying every loss as a risk, that is, people could move from a flood prone area. Of course, and as Luhmann (1993: 28) states, 'there is no risk free behaviour'; by moving from the flood prone area, for example, you may be foregoing an opportunity, e.g. a job afforded by living in the area or surrounding views, thus running the risk of not gaining those benefits were a flood never to happen. In the

case of the risk/security distinction this means there's no absolute safety and in the risk/danger distinction, risks cannot be avoided if any decision is taken at all.

If, as Luhmann proposes, there are no risk-free decisions, the hope that more research or more knowledge will permit a shift from risk to security must be abandoned. Practical experience, he goes on to suggest, teaches the opposite; that is, 'the more we know, the better we know what we do not know, and the more elaborate our risk awareness becomes' (1993: 28). Luhmann concludes,

The more rationally we calculate [and] the more complex calculations become, the more aspects come in to view involving uncertainty about the future and thus risk. Seen from this point of view, it is no accident that the risk perspective has developed parallel to the growth in scientific specialization. Modern risk-oriented society is a product not only of the perception of the consequences of technological achievement. Its seed is contained in the expansion of research possibilities and of knowledge itself. (1993: 28)

Luhmann thus defines risk by attribution to decisions (much as Beck does although Luhmann's analysis has very different implications). He posits that the emergence of the modern concept of risk is related to a more pronounced or reinforced difference between the past and the future when more has to be attributable to decisions. For Luhmann, attribution to decision making is causal attribution. It has to be conceivable in the schema of cause and effect; and it must further be plausible that the decision-makers can see that they are the cause of the effect they trigger. As noted, Luhmann asserts that causality is 'embedded in an infinity of further causes and further effects'. (1993: 118)

Luhmann posits the modern era as characterised by an increased uncertainty which is exacerbated or even caused by the increased emphasis on the difference between the past and the future. For Luhmann, the increased uncertainty relates to contingency on decisions and the fact that a concatenation of decisions results in present circumstance, but no causal relationship between the decisions and the nascent circumstance can be drawn. In this situation Luhmann asserts attributing risks to decisions occurs without a guarantee of rational decision-making being possible. He contends that 'often the only thing that is certain is that decisions were involved, and

that only widespread and general precautionary or loss spreading measures can be of any use' (Luhmann 1993: 119).

He suggests that it is thus important to 'allow for the possibility that modern society attributes too much to decisions, and does so where the decision-maker (either an individual or an organisation) cannot be identified' (ibid.). Luhmann asserts that the mechanism of attributing risks is, thus, circular in operation. The uncertain negative consequences that one can attribute to decisions are taken as the risk of the decision. He contends that for this reason, the environmental changes actuated by the structural complexity of society, and what one wants to be regarded, treated and averted as risk, are taken, vice versa, to be *the consequence of decisions*. (Luhmann 1993: 119)

Luhmann (1993: 120) asserts that 'this happens even when the decision-maker cannot be pinpointed, and there is consequently neither a possibility of calling him to account or to learn from the situation'. He thus contends that the attribution of losses to decisions is an empty operation that assumes secondary functions, for example, to alert public attention, to stimulate protest movements, to crystallise prejudices and worry about the future. A large number of modern social structures (in particular long-term ecological problems) are seen to have these effects. In the ecological context there are extremely long stretches of time between cause and effect, and there are a very high number of contributing factors - which excludes the evaluation of threshold values, of date of occurrence, and of time required for countermeasures.

For Luhmann (1993: 120), this situation excludes both the identification of the guilty perpetrator and the demand to include the calculation of the risk in the decision-making procedure. From this 'attribution perspective' it is a matter of 'risks that would not arise were the future in our society not so completely dependent on decision-making' (ibid.). One can also identify risks as dependent on decisions. On the other hand there are no alternative decisions, no possibility of risk free behaviour. To this extent the distinction of risk and danger fails – 'the risk is the danger' (Luhmann 1993: 121). Risk/danger can only be viewed as a paradox.

In the contemporary age people have to live without much confidence in secure prospects for the future. A society which describes itself through protest against itself

will only be able to confirm this time and time again. In Luhmann's view society deals with the paradoxical situation it faces - whereby decision-making is seen to result in the emergence of considerable losses which in turn cannot be attributed to any decision, thus becoming both risk and danger – not by trying to solve it but rather by accepting and elaborating it, which means multiplying and specifying the risks. There are parallels between Luhmann's and Beck's theories of risk but they also differ significantly in their view of society and their interpretation of the meaning of risk for contemporary society. This discussion now turns to Beck's work before the points of comparison and departure are addressed.

### *The Risk Society*

Beck and Giddens have been noted for their similarities in approach to risk. It is the work of Beck that has been utilised in formulating the analysis (although Giddens is also referred to) for its greater conceptual clarity in discussing risk. It is thus Beck's treatise on risk that requires detailing in this chapter. To begin this brief overview, Beck's analysis of contemporary society is comprised of two primary and interlinked concepts; reflexive modernisation and risk society. At its core Beck's (1992a) risk society thesis is a theory of social change. However, unlike many theories of social change that suggest a distinct break with what has gone before, Beck has asserted that the contemporary world is characterised, not by a disjunctive break in the form of post/industrial or post/modern, but by an unseen, unnoticed non-revolution.

His theory of social change is comprised of what Lash and Wynne (1992: 3) identify as essentially three stages 'first pre-modernity, then simple modernity, and finally reflexive modernity'. Simple modernity corresponds with industrial society, while reflexive modernity is congruent with the 'risk society'. Wynne and Lash explain, 'industrial society and risk society are for Beck distinct social formations'. Industrial society is characterised by the distribution of 'goods' and risk society by the distribution of 'bads'. In addition, industrial society is structured through social classes while the risk society is individualised. The risk society however, also remains as industrial society because it is primarily industry - in conjunction with science - that is involved in the creation of the risk society's risks (Lash and Wynne 1992).

For Beck, modern society, by virtue of its inherent dynamism, is undercutting its formations of class, stratum, occupation, sex roles, techno-economic progress and so forth. This process constitutes the emergence of a 'new stage, in which progress can turn into self-destruction, in which one kind of modernisation undercuts and changes another'; this is the stage of reflexive modernisation (Beck 1994: 2). Beck (1994: 3) proposes that the transition from simple modernity to reflexive modernity occurs unseen 'on cat's paws as it were'. Reflexive modernisation is the modernisation of modernisation, that is, it is not change per se that is causing the (self-)destruction of contemporary society but more of the same. Beck surmises (1994: 2), 'the 'subject' of this creative (self-) destruction is not the revolution, not the crisis, but the victory of Western modernization'. He characterises what is currently happening as '*sliding* into a new society without the primeval explosion of a revolution' (ibid.) [my emphasis]. In Beck's (1994) formulation it is 'the desired' plus 'the familiar' that equals 'the new modernity'.

Beck takes a critical stance on 'simple' modernity emphasising the darker dimension to the modernizing developments, 'especially in the constitutive role assigned to science and knowledge' (Lash and Wynne 1992: 2). Lash and Wynne (1992: 2) explain that 'for Beck the consequences of scientific and industrial development are a set of risks and hazards the likes of which we have never previously faced'. It is important to indicate that in suggesting the emergence of risks that have 'never previously been faced', Beck is not proposing that 'risk' is anything new per se. On the contrary Beck makes explicit his view that 'risks' are inseparably tied to the idea of rational calculation and as such, arose in what Beck terms simple modernity. Rather, Beck implicitly makes a distinction between what might be considered old risks and new risks<sup>3</sup> (Strydom 2002).

The epochal difference between the risks of industrial society and the bourgeois social order and the hazards and demands of risk society is that in risk society the hazards, which are decided and consequentially produced by society, undermine the established safety systems. Beck asserts that 'the entry into risk society occurs at the

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<sup>3</sup> This distinction is developed in chapter eight where Beck's analysis are discussed in connection with Adam's time theory to elucidate a distinction (and the consequent implications of an intersection) between flooding and climate change.

moment when the hazards, which are now decided and consequently produced by society, undermine and/or cancel the established safety systems of the provident states existing risk calculations' (Beck 1996: 31). The emergence of risk society is summarised by Beck as follows;

This concept [risk society] describes a phase of development of modern society in which the social, political, ecological and individual risks created by the momentum of innovation increasingly elude the control and protective institutions of industrial society. (Beck 1996: 27)

Beck asserts that the risks of contemporary society can no longer be limited in time as future generations will be affected. They can not be limited spatially either, as they cross national boundaries and no one person can be held accountable. Moreover, he points to the problems in compensating those whose lives are touched by contemporary hazards 'as their very calculability becomes problematized' (Lash and Wynne 1992: 2). The emergence of these types of 'risk' that cannot be dealt with in the industrial society are seen as indicating a social change; the transition from industrial to risk society. This, as has been iterated above, occurs unseen; it is happening regardless of whether or not it is acknowledged by humankind and it entails the (self-)destruction of the industrial epoch by means of its very successes.

Beck (1996) sees the absence of private insurance as marking the move into risk society. He writes 'anyone who inquires as to an operational criterion for this transition has it to hand here: the absence of private insurance cover' (Beck 1996: 31). He suggests, that 'industrial technical-scientific projects are *not insurable*' (ibid.). It is the uninsurable nature of the risks created by contemporary industrial society that Beck asserts as the identifying factor in the transition to risk society. The coping strategies of risk and insurance that Beck identifies as being integral to industrial modernity, fail in the face of risks like climate change and genetic modification. In this sense, it is the private insurance companies that 'mark the frontier barrier of risk society' (Beck 1996: 31).

This yardstick, which marks the transition to risk society, does not, Beck explains, require any sociologist to introduce it, for it is society itself that produces this standard. 'Industrial society, which has involuntarily mutated into risk society through





its own systematically produced hazards, *balances beyond the insurance limit*' (ibid.). He suggests that the rational foundations for this judgement are derived from the core rationality of modern contemporary society; *economic* rationality. The logic of economic rationality is used by the insurance companies to contradict the safety proclamations of technicians working in the danger industries 'because they say that in the case of low probability-high consequence risks the technical risk may tend towards zero while at the same time the economic risk is potentially infinite' (Beck 1996: 31). This for Beck makes clear the extent of what he calls 'normalised degeneration'; that is how the demise of industrial society by its own means has been normalised.

Beck distinguishes two phases to the emergence of risk society; 'the first is a stage where the consequences and self-endangerment are systematically produced, but are not the subject of public debate or at the centre of political conflict' (1996: 29). In this phase the self identity of industrial society, which legitimates hazards (new risks) resulting from decisions made, dominates. This is the 'residual risk society' (ibid.). The second phase entails a completely different situation whereby the hazards of industrial society dominate public, political and private debates. In this phase industrial society sees and criticises itself as risk society. Society still makes decisions according to old industrial society but 'debates and conflicts which originate in the dynamic of risk society are already being superimposed in the interest organisations, the legal system and politics' (Beck 1996: 28). Beck surmises;

If we call the autonomous, unintentional and unseen reflex like transition from industrial to risk society reflexivity- in distinction and opposition to reflection- then *reflexive modernisation means self-confrontation with the consequences of risk society* which cannot (adequately) be addressed and overcome by the system of industrial society (that is, measured by industrial society's own institutionalised standards). At a second stage this constellation can, in turn, be made the object of (public, political and academic) reflection, but this must not cover up the unreflected, reflex like mechanism of the transition. (Beck 1996: 28) (*My emphasis*)

Ecological concerns are, in Beck's thesis, not 'environmental problems' per se, not a problem with the world that surrounds us, but a far reaching institutional crisis of industrial society itself. He asserts that as long as these issues continue to be construed as 'negative side effects of seemingly accountable and calculable actions,

their system breaking consequences go unrecognised' (Beck 1996: 32). Their significance only emerges when seen against the horizon of the risk society, where attention is drawn to 'the need for reflexive definition and re-definition' (ibid.). Beck (1996: 32) suggests that in the risk society, recognition of the incalculability of the 'hazards' produced by the technical-industrial development 'compels self reflection on the foundations of the social context and a review of prevailing conventions and principles of "rationality"'. He asserts that society itself becomes reflexive in the sense that it becomes a problem to itself.

Beck (1996: 32) posits that in industrial society, the bourgeois social order, particularly the provident and social state, are subject to the demand that human lived relations and experiences are made 'instrumentally rationally controllable, capable of being produced, available (individually and legally) and accountable'. The shift into risk society however, entails the unforeseeable side effects of instrumental rationally calculated behaviour leading back to 'the modernisation of whatever cannot be calculated, answered for or easily comprehended' (ibid.). Therefore, in Beck's risk society, the instrumentally rational behaviour which creates life as controllable also creates unforeseeable side effects that cannot be controlled or calculated within the remits of instrumental rationality, thus they lead back to the uncontrollable and unaccountable.

For Beck, this correspondingly means that the various societal measures of organisation are not suitable for grasping and legitimating the processes that have been set in motion by instrumentally rational behaviour. That is, ethical and legal principles like responsibility, blame and the 'polluter pays principle', as well as political decision-making procedures are not appropriate for coping with these processes. It is not, Beck asserts, only a matter of making decisions, in the face of the unforeseeable and unaccountable consequences of the industrial way of life, the principles of decision-making need to be redefined.

Beck suggests the potential for tackling this creative (self-) destruction through the radicalization of rationalisation. Before elucidating this, it is worth explaining that reflexive modernisation entails two components or 'dimensions of meaning'. It refers, on the one hand, to the automatic transition from industrial to risk society or to the

reflex-like threat to industrial societies own foundations through a successful further modernisation which is 'blind to apocalypse', and on the other hand it refers to the growth of awareness and reflection upon this situation. For Beck then his critique relates to the unseen 'stumbling' of industrial society into 'the no-mans land of uninsurable hazards'. It is 'to the extent that this, briefly, is seen' that Beck (1996: 35) holds out hope for the 'fatalistic industrial modernity' to 'transform itself into a conflictual and self-critical risk society'.

Beck's Risk Society thesis has undoubtedly been influential and (as might be expected by such a widely cited source) has also been the subject of much criticism. Beck has revised or perhaps clarified his thesis compiling and summarising his notions in *World Risk Society* (1999) and again in a chapter in *The Risk Society and Beyond* (Adam, Beck and Van Loon 2000), some of these clarifications have been drawn upon here. The aim for now is merely to give an overview and indication of Beck's wider theory. The notions which are utilised most prominently here relate to Beck's distinction between 'old' and 'new' risks and correspondingly his discussion of the emergence of industrial 'risk'. This distinction has been utilised along with the timescape perspective to further understanding of flooding and climate change as distinct issues and thus the conceptual implications of interconnection (see chapter eight). Beck's notions with regard to this will be explained and outlined in greater depth when they are taken up in analysis later in the thesis. For now, this broad overview of Beck's arguments as they relate to risk society has been important in providing a wider context for the aspects of his work that are drawn upon selectively later in the thesis.

### **Of Conceptual Matters**

As noted, a wide range of sociological work on risk has been drawn upon in this thesis. The risk theories of Beck and Luhmann, together with Adam's work, have been utilised most prominently in informing the discussion, to be had later in the thesis, regarding the nascent framing of flooding (chapter eight). In addition, it is these works that have been most influential in terms of this researchers analytical thought in the research process. For this reason they have been given a level of special attention to which the other theoretical works on risk have not been subject. It is

Adam's temporal theory, however, that is adopted as a wider theoretical lens on the social world and on the issues at hand<sup>4</sup>.

The temporal perspective, discussed earlier, is favoured in this thesis for the capacities it allows in conceiving socio-environmental issues. The understanding of the social world and of social research depicted in Adam's work aligns most closely with the ontological and epistemological position in this thesis. The arguments with regard to these matters have been given attention in the previous chapter and earlier in this chapter and thus do not require re-iterating. Suffice to say the temporal theoretical lens is aligned with the methodological approach. The researcher is seen as part of the social world under study; included in this worldview are the temporalities of both nature and the social. The notion of a separate social world distinct from nature is rejected. The researcher is viewed as embodied and firmly located within a 'social world' understood to encompass nature and culture. The timescape perspective facilitates this and allows a multiplex way of looking. The works of Beck and Luhmann entail conceptions of the social world and of socio-environmental issues that differ more markedly from the position here. In this respect the differences between their conceptual positions and the extent to which they align with the views in this thesis require some brief discussion.

Beck and Luhmann's works on risk bear similarities and stark differences. Their conceptual stances are in many senses opposing. Beck favours a critical stance and thus seeks to retain a diagnostic view of contemporary society. While Luhmann, adopts a sceptical view questioning the possibility of grasping 'society' as a whole. In this sense Luhmann's approach has been compared to that of post-modernists or post-structuralists with their decomposition of totalities and uniformities. The difference here relates in part then to Beck and Luhmann's differing in epistemological positions.

Luhmann's position is clear and constitutes what has been referred to as a 'strong constructivism' (Strydom 2002: 47). Beck's view by contrast shifts between

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<sup>4</sup> There are overlaps in the ideas of Beck, Luhmann and Adam. The aspects of similarity important for analysis are drawn out when they are utilised and discussed together in chapter eight.

constructivism and realism. As such it has been the subject of debate and critique requiring him to clarify his position as late as 2000. Wynne (1996) and Lash (1994), for example, have critiqued Beck (and Giddens) for tending towards a realist position (although they acknowledge their attempts to redress or clarify these interpretations). In *The Risk Society and Beyond*, Beck (2000: 211) delivers a clarification of his position asserting that he 'consider[s] realism and constructivism to be neither an either-or option nor a mere matter of belief. He contends;

We should not have to swear allegiance to any particular view or theoretical perspective. The decision whether to take a realist or constructivist approach is a pragmatic one, a matter of choosing the appropriate means for the desired goal (Beck 2000: 211).

Beck explains that if he should have to adopt a realist position (momentarily) in order to communicate the 'new and contradictory experiences of the global age of global risks' then he is happy to take on the 'guise and language of a ('reflexive') 'realist'' (ibid.). By contrast he explains that 'if constructivism makes a difficult problem shift possible and if it allows us to raise important questions that realists do not ask, then I am content (for that moment at least) to be a constructivist' (ibid.). Beck concludes his clarification asserting that he does not restrict himself to one perspective or conceptual dogma. He writes;

I am both a realist and a constructivist, using realism and constructivism as far as those meta-narratives are useful for the purpose of understanding the complex and ambivalent 'nature' of risk in the world risk society we live in (2000: 212).

It is perhaps a consequence of the topic with which Beck concerns himself that this epistemological difficulty (although perhaps Beck does not see it as such) arises. The study of environmental issues (particularly contested ones) marks a difficult territory for the social researcher. Hannigan (2006: 24) explains how Beck's 'inconsistency' in his realist/constructivist positioning 'reflects a long-standing tension in environmental sociology between the role of the sociological analyst and that of the environmental activist'. The tension that Hannigan points to has been found as a difficulty in conducting this research. These issues in relation to studying environmental issues within sociology have been discussed in relation to this research in chapter two. Beck's position on these matters, however, is in some senses aligned with the position

in this thesis, in that, the notion of a stark dualist division between realism and constructivism is rejected in favour of the notion of a continuum of positions. The differences in perspectives for many relate to epistemological concerns rather than representing polarised ontological positions. They are seen as relating to the differing aspects of the social world which scholars choose to emphasise i.e. constructivist works place emphasis on social, cultural and political processes (Irwin 2001)<sup>5</sup>.

With regard to Beck and Luhmanns works there is a further significant point of contrast found in their views on the social world and socio-environmental issues. Luhmann's *sceptical* theory of risk in contemporary society can be contrasted with Beck's more *optimistic* understanding of the processes occurring. Beck makes various proposals concerning the possibility of resolution of the problem of self-endangerment. In 2000 Beck explains how he is working on 'a new and optimistic model for understanding our times' (2000: 226). In this endeavour he proposes a revitalisation of Enlightenment, conceptualised by Beck, not as a historical notion and set of ideas but as a process where criticism, self-criticism, irony and humanity play a role. Beck (ibid.) explains that where for many theorists 'rationality means "discourse" and "cultural relativism"', for Beck, his notion of 'second reflexive modernity' implies that 'we do not have enough reason to live and act in a global age of manufactured uncertainties'. He argues for an 'opening up to democratic scrutiny of the previous depoliticised realms of decision-making and for the need to recognize the ways in which contemporary debates of this sort are constrained by the epistemological and legal systems within which they are conducted' (Beck 2000: 226).

In addition, Beck proposes a reconstruction of social definition of risks and risk management in different cultural framings. He suggests that there is a need to 'find out about the negative power of risk conflicts and definition where people who do not want to communicate with each other are forced together into a community of shared (global) risks' (Beck 2000: 227). For Beck this would lead to or necessitate a consideration of questions relating to his notions of 'organised responsibility' and 'relations of definition' (akin to Marx's relations of production) in different cultural-

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<sup>5</sup> See chapter two for discussion of this.

political settings (ibid.). In contrast, Luhmann's analysis undercuts Beck's optimistic approach in some important respects. Strydom (2002) explains this difference:

Irrespective of whether it is waiting for the self-destructive and self-critical tendencies to manifest themselves, reversing the burden of proof, establishing principles of attribution and liability, developing a network of reciprocal control measures, holding prior debates about consequences, strengthening the possibilities of contradiction or veto, and revitalising enlightenment- in the sceptical view all these measures remain caught up in the unavoidable dilemma of risk politics. They only add to the central problem of decision making, rendering it more complicated and difficult, without any prospect of discriminating between the good and the bad consequences. (Strydom 2002: 68)

The difficulty, which Luhmann points to as being part of the complexity of society, is that it is often impossible to point to any particular decision as causing any nascent problem. To use Luhmann's (1993) example, even when questioning the extent to which automobile exhaust fumes are responsible for the death of forests, it would not be possible to classify starting a car engine as a risky decision. In Luhmann's view a concatenation of decisions, rarely identifiable in their origins, results in occurrences which can never be traced to individual causal decisions, even though it is clear that in order for the circumstance to emerge decisions have been taken. This means that just because human decisions appear to have a role in the creation of contemporary risks this does not equate to a capacity to address them through self-criticism or any other means. For Luhmann, then there are no means, even in addressing the wider assumptions which underpin societal workings, for countering the emergent risks and their symptoms, indeed because in this sense there are no such problems.

Beck, although offering a critical take on the capacity of contemporary institutions to solve risk problems at present, clearly supports an argument for change and believes in the potential for addressing the pressing risk issues which he sees as characterising contemporary society. Indeed, Beck delineates a clear view on the role for sociology asserting the necessity to resist tendencies towards cynicism, and instead to remain open to the possibilities for the transformation of cultural, social and political assumptions and structures. This contrasts starkly with Luhmann's sceptical stance and view that the complexity of society (and temporality) renders the consequences of decisions unrecognisable at the time that they manifest.

Both views in their lesser extremes resonate with the social world as it has been seen and interpreted from the data here. The complexity and scepticism, which Luhmann offers, gives a clearer indication of the scale of the difficulty to be faced in comprehending and addressing contemporary concerns (although Luhmann would not characterise them as requiring 'addressing' per se). Beck's proposals regarding the capacity for change however, have much stronger appeal than the scepticism and incapacity to act which Luhmann leaves his readers with. Indeed, there was a strong sense in the empirical analysis of what will be characterised as a 'muddling through' which resonated more strongly with Beck's optimism. In addition, Beck's argument relating to the incapacity of contemporary institutions and their tools to cope with the nascent risks of the 'risk society' also delivers an indication of incommensurability of the difficulties in overcoming contemporary environmental concerns although, as noted, Luhmann provides a far stronger picture of this.

As previously explained, these risk theories have only been utilised here for their capacity in elaborating the concept of risk. Their analyses have been used to explain both the difficulties engendered in tackling socio-environmental issues in the contemporary age and the increasing pervasiveness of 'risk talk' in relation to flooding (Power 2004: 9). The problem of flooding is seen as entailing new challenges as the issue comes to be framed (at least by those working in areas connected to the issue) in association with climate change. Beck's analysis of the present-day concern with risk has been useful in understanding this intersection of climate change and flooding and in identifying them as distinct issues. Despite his differences to Beck, Luhmann's interpretation of the 'pervasiveness of risk' has been important in understanding the prevalence of risk in contemporary society. Adam's work is also significant with respect to these aspects of analysis in the thesis. The analyses of Beck and Luhmann are thus not adhered to verbatim but rather drawn up and adapted in ways which furthered the analytical process.

The role the works of Beck, Luhmann have played in inspiring analysis and in the extrapolation of that which was initially only intuitive has been significant, thus a discussion of these works is important. It is however, specific elements of their explanations for the present day concern with risk, rather than their broader theories



that are the focus here. Strydom asserts that neither Beck's nor Luhmann's work is satisfactory as a theoretical position simply and purely by itself. Beck can be critiqued for his 'naïve optimism', while Luhmann is described as being 'too fond of the normatively devoid paradoxical complexities of society' (Strydom 2002: 69).

Strydom (2002: 70) thus favours some reconciliation made possible through the taking of theoretical choices made 'on the basis of an evaluative position favouring the possibility of learning and democracy, without excluding awareness of obstacles and ambivalence'. Indeed, this is the position adopted here, one that resides somewhere in between their analyses, drawing upon both to shed light on the complex social world as it appears in the empirical data. It is the temporal perspective which Adam (1997; 1998; 2004) provides that has been employed more widely as a lens through which to view the social world. It has been important to acknowledge the conceptual differences between the works of Beck and Luhmann, both in terms of their epistemological positions and their differing interpretations of risk in contemporary society. They are, however, utilised in this thesis (with Adam's work) for the similarities in their understanding of the emergence of risk for modern and contemporary societies.

The time and risk theory have been utilised together in this thesis but the departure point for analysis was temporal theory. Viewing the empirical issues from a temporal perspective, difficulties were noted as being engendered in applying risk rationality and calculation to contemporary socio-environmental issues. The association between climate change and flooding, along side an increasing emphasis on risk and risk calculation, arose as important from the empirical data. Questions thus arose regarding the potential reasons for this increasing risk focus and the significance of risk. These questions, initially derived from the temporal conceptual literature (and the empirical data), were explored through analysis of the risk literature. In this way the two literatures have been brought together with the empirical data in creating the story told here. The explanatory power, which the works of Beck, Adam and Luhmann offer with regard to the increasing prevalence of risk in contemporary society, is combined with the analysis of the empirical data in examining the nascent risk discourse in relation to flooding.

### **Concluding Remarks**

This chapter has given a broad insight into the theoretical notions which inform the analysis. The choices that have been made with regard to theory have been explained and the particular applications herein indicated. The work of Beck (1992a, 1992b, 1994, 1996, 2000), Luhmann (1993) and Adam (1997; 1998; 2004) have been noted as particularly significant in the analytical process and thus more time has been dedicated to the discussion of these rather than other works which are utilised in the thesis. For Luhmann and Beck, the specific focus on ecological concerns with regard to risk has made their treatises of particular importance. In a similar respect Adam's focus on time specifically in relation to environmental concerns and risk make her works of major significance for this project. These authors' works on risk and time have been drawn together and applied both in raising questions and in an explanatory capacity. Temporality and risk are central to both Luhmann's and Adam's work, Beck by contrast is more closely focused only on risk. Elements from their works are drawn together in this thesis in ways which have provided important insights for considering the socio-environmental issues under investigation here.

From Adam's (1998) timescape perspective, risk appears as 'out of sync' with the conceptual tools needed for understanding contemporary socio-environmental issues, such as climate change. Taking risk as his focus Beck (1992) makes similar assertions relating to the characteristics of novel ecological concerns and the difficulties they present for conventional risk calculation. Both Adam and Luhmann give attention to the temporal domain of the future and its connection to risk<sup>6</sup>. These theoretical notions are drawn together in the formulation of the questions which have arisen through analysis of the data and for the explanatory capacity they can provide in illuminating the increasing emphasis on risk. These assertions are examined with the empirical data to create the story told here. In the final chapter they form the focus as their explanatory potential with regard to the empirical analysis is explored.

It should be highlighted that the reading of these theoretical works has been done in conjunction with the reading and interpretation of the data. Throughout the research

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<sup>6</sup> Other writers such as Lupton (1999a, 1999b) and Rose (1999) have also characterised a relationship between risk and the future.

process there has been a constant flow between theory and data analysis, with both shifting thought forward at varying points. It is from the data, however, that the driving force has been derived. It was during data analysis that the researcher turned back to literature for insights. At this point various elements of these three writers work appeared to have resonance with the data and thus became important focal points for analysis, albeit within a wider framework of conceptual ideas from various others authors. The process of utilising theory has thus been a fluid one throughout the PhD, involving constant and sustained movement between the theoretical notions and the data.

The wider theoretical foundations of the works of these writers were important to acknowledge if only to make clear they are not applied in their entirety. Luhmann's work in particular is embedded within his wider systems theory and, as such, it was necessary to note that his work on risk is utilised here as a tool for conceptual analysis, rather than his work being treated to a full application or explication. Beck's work is also drawn upon later for specific elements of his analysis, but the assertions in this PhD are not congruent with all of the contentions within the risk society thesis. The epistemological position taken up in this thesis has been briefly discussed in relation to Beck, Luhmann's and Adam's work, with the constructivist leanings of the stance employed reiterated. Irwin's (2001) co-construction has been noted as being utilised here as an acceptable resolution, if only for present purposes. This position is complimented by the timescape perspective which facilitates the capacity to view the complex interconnections between, and temporalities of, the social and the natural worlds, encompassing both and offering a multiplex way of looking. This broad discussion of the major theoretical works employed in this thesis is laid out as a foundation for the subsequent analysis.



## Chapter Four

### Discourses of Flood: Framing Flooding as a Social Issue

We recognise, then, that countries have attained a high level of civilisation if we find within them everything which can assist in the exploitation of earth by man and in his protection against the forces of nature – everything, in short which is of use to him – is attended to and effectively carried out. In such countries where rivers threaten to flood the land they are regulated in their flow, and water is directed through canals to places where there is a shortage (Freud 1930/1961: 45)

#### Introduction

The human concern with water holds an important and enduring position throughout history. Water is at one time associated with both need and fear; the need for water has led to settlement close to it, and the fear of water can be seen as having driven efforts to control it. This paradoxical relationship with water, and the subsequent influence it has born on human development, has clear significance in any attempt to discuss flooding. The human connection with water may be enduring but how that relationship to water is conceived has varied considerably over time, and thus how flooding is perceived has shifted through time.

Flooding has been conceptualised and understood in significantly different ways throughout history. In biblical and mythical perceptions, flooding has been depicted as inflicted upon humanity by some supernatural force. Multiple accounts of floods appear across time in varying cultures that delineate flooding as God given (see Simmons 1993; Leeming 1990; Cavendish 1980; 1983). In the contemporary age the varying mythical understandings of flooding are still present, but it is the scientific account of floods, informed by knowledge of the hydrological system, which now dominates comprehension in the western world. Since the Enlightenment science has come to monopolise understandings of nature (Macnaghten and Urry 1998) and with this the conceptualisation of flooding altered. Flooding is no longer conceived as the

wrath of God but has come to be seen through the scientific lens, as a natural hazard, understood as occurring through processes of rainfall, land saturation and so forth.

It is proposed here, that in recent times a further change in the discursive characterisation of flooding has begun to emerge. Flooding has come to be understood as being, in part, caused by human actions. Today, in the UK discourse, flooding is beginning to be delineated as a symptom of climate change. A heightened and far more overt connection is being made between flooding events in the UK and changes in the global climate. It is suggested further, that the recent increase in flooding events across England and Wales<sup>1</sup>, have been a catalyst for this heightened adherence to a framing of flooding as a climate change impact.

In addition, land-use and hard flood defence measures have come to be demarcated as increasing the likelihood of flooding. Floods are conceived as being escalated by land development, particularly of flood plain land as these once 'natural' defences against floods are built upon. In addition, the pressures placed on sewerage and drainage systems by increasing development, as well as industrial farming practices are also denoted as land use issues associated with escalating flooding. At the same time, difficulties with flood defences are recognised and they come to be delineated as an inadequate solution due to their propensity to cause flooding in other areas i.e. they act to force waters down the path of least resistance.

In a society characterised by high levels of development there are perceived limits to such an approach, both economically in providing defences for more and more developments and environmentally as structurally altering natural systems comes to be seen as damaging for ecological systems. These issues with regard to growing development and defence are exacerbated by the expectation of increases in flooding with climate change (Hulme et al 2002). The discourses regarding hard flood

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<sup>1</sup> For example, the Easter 1998 floods; these floods were the worst on record for an area of 5000 square kilometres bounded by Bedford in the East, Evesham in the west, Peterborough in the north and Oxford in the South. There have been several more incidents of flood since these events; the worst of which were in 2000, when widespread and severe flooding occurred during October. Since this study began there have been further notable events of flood in 2003 and 2007.

defences and land-use thus intersect with concerns about climate change to create a particular contemporary understanding of flooding.

It is thus suggested that the understanding of flooding as a contemporary issue is dominantly shaped around knowledge(s) of these three aspects of concern. First, that flooding is expected to increase due to climate changes. Secondly, that the notion of defending against floods or 'holding the line' has become inadequate as a solution. And thirdly, the role that high and increasing levels of development play in further heightening the likelihood of flooding events. Conceptualising flooding as a climate change impact opens the lens of the long-term future, wherein flooding is conceived as a problem that will increase and worsen in the future. With this long-term view, the noted difficulties in sustaining hard flood defences and increasing levels of development become more problematic still. It is posited that these three concerns merge to create the dominant contemporary framing of flooding in the UK today. This chapter will focus upon evidencing and elucidating these claims from which the thesis will proceed. The PhD is focused around the paradoxes which arise in attempting to address flooding in this particular, contemporary framing.

### **Increasing Flood Risk: A Changing Climate?**

This discussion begins with an extrapolation of the claim that, in relatively recent times, flooding has come to be framed as a symptom of anthropogenic climate change, with the increases in flooding acting as a catalyst for this change. The links between flooding and climate change were iterated by all of the participants in the study. The connection between the two issues also emerged as a theme in the document analysis. Written texts from institutions and organisations including charities, such as the World Wildlife Fund (WWF), Government institutions such as the Department for Environment, Food and Rural Affairs and the Environment Agency (DEFRA), and independent organisations like the Association of British Insurers<sup>2</sup> (ABI), as well as academic institutions such as the Flood Hazard Research

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<sup>2</sup> The ABI is the trade association for Britain's insurance industry. Its nearly 400 member companies provide over 94% of the insurance business in the UK (ABI 2007a). Other insurance companies (within the remaining 6%) thus may provide insurance for higher risk properties. However, additional research has indicated that some insurance companies will not accept flood risk below a 1 in 1000 probability-higher than the ABI.

Centre (FHRC), all portray flooding as linked to climate change. In the following analysis, examples from the document and interview data will be laid out in support of this claim regarding the emergence of the climate change framing.

Initially, the policy discourse communicated through documents and interviewees will form the focus of the analysis. Following this the wider discourse will be elucidated, including examination of the narratives from participants and documents classified as affiliated with independent organisations, the academic arena, the insurance industry, and the scientific community. The first of these quotes is taken from the Environment Agency website (defined as a politically affiliated organisation) under the heading 'Managing flood risk has never been more important' (2006a). This extract provides an indication of links being drawn in England and Wales between flooding and climate change.

Over 2 million properties in England and Wales are at risk from flooding. Changes in our climate, such as more severe storms and wetter winters, will increase that risk. (Environment Agency 2006a)

In this quote, the link between flooding and climate change is clearly asserted, with changes in the climate being cited as a factor in increasing the likelihood and severity of floods in the future. The emphasis on flooding increasing *in the future*, due to climate change, is an important detail regarding this representation. In the data flooding is delineated as linked to climate change, but more specifically it is depicted as an issue that will be caused by the resultant temperature increase in the future. Thus, recent and present flooding events are not depicted as having been caused by climate change *per se*, but as indicative of the increases in future events to be expected<sup>3</sup>.

This relatively new emphasis upon climate change found in the contemporary representation of flooding requires further unpacking. Several of the interview

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<sup>3</sup> It is noted that there may be a greater presence of discourses which depict a direct causal relation between the 2007 floods and climate change but this analysis is of the discourses following the 1998 and 2000 floods. The 2003 floods occurred while research was ongoing but the two events of flooding in 1998 and 2000 are seen as the influential events in driving the initial shift in representation and understanding.

participants delineated as affiliated with political institutions<sup>4</sup>, described an association between flooding and climate change. Below one of these participants is cited.

Interviewer: Where in your view does the issue of climate change feature in the discussions around flooding?

Participant: It features very prominently, right up there at the top of the agenda.

(Pol. Participant 4)

The interlocutor<sup>5</sup> asserts that climate change is at the 'top of the agenda' in relation to flooding. This is indicative of the notion that flooding is increasingly conceived as associated with climate change. This same participant also referred to the concept of 'future proofing' developments in taking account of climate change, further emphasising the climate change frame.

Well, we plan for future flooding in our plans and when we design or deliver any flood risk management activities we always take into account climate change - potential impacts of climate change on flood levels, flood flows, flood duration - to make sure that we're future proofing our development. (Pol. Participant 4)

This interviewee makes clear links between flooding and climate change. They suggest first, that climate change is at the top of the agenda with regard to flooding, and secondly, that 'potential impacts of climate change' are taken into account with regard to technical decisions about flooding. These statements provide clear evidence for the assertion that flooding is framed as an impact of climate change. Below, another interviewee, identified as a political social actor, gives their answer to a question concerning the current prominent research themes with regard to flooding.

Interviewer: So what are the core [research] themes that you're exploring at the moment?

Participant: I'll tell you what's current. We are doing research to develop a range of tools and techniques to help people assess risk better... So *climate change would be a key input* there in looking at how the loads on our system are likely to change in the future. (Pol. Participant 6) (*My emphasis*)

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<sup>4</sup> In chapter two the use of categories to describe participants for analytic purposes is explained (see chapter two pages 64-65).

<sup>5</sup> This term is utilised to refer to participants and is meant in the vernacular sense of term indicating 'a participant in a discussion or conversation' (Encarta English Dictionary).



The climate change frame is clearly evident in this response. The narrative is imbued with the notion floods will increase due to climate change. It is interesting to note again, that this participant locates these changes due to climate change in the future. Thus, the participant imparts the notion that flooding is a climate change impact, but depicts this as the future of flooding, rather than the present. The following participant - also designated as having some form of political or policy role - highlights the connection between flooding and climate change.

We produced the climate change scenarios, this is important for adapting for climate change. DEFRA and the Agency have already agreed to incorporate a pre-cautionary allowance in the [flood management] designs.  
(Pol. Participant 16)

This participant provides further indication of the significance of climate change in relation to flooding. In this narrative flooding is again delineated as a climate change impact. It has become clear from the analysis that the framing is more complex than a shift to understanding flooding as directly caused by temperature rise. That is, flooding is not demarcated as purely a climate change impact, but is discussed as an issue which will *worsen* because of climate change. Flooding is conceptualised as an issue independent of climate change first, with changes in climate being considered as a significant factor which will increase and worsen flooding in various (and uncertain) ways. This is a more nuanced interpretation of the representation but it does not detract from the clear importance of climate change in defining flooding as a contemporary concern.

The following quote is taken from an interview with a participant also from within the policy domain. This interviewee describes climate change as a high priority that requires addressing in relation to adaptation, thus designating flooding as a climate change impact.

Flooding is one of the top four or five issues that we need to address for adaptation to climate change. I mean obviously the UK government's stance is that mitigation is desirable, so that we reduce future climate change, but also to plan for what is almost certainly inevitable future change because of the potential for change already built up in the oceans and the atmosphere. (Pol. Participant 12)

In this interlocutor's narrative it is again possible to see that flooding is discursively represented as a climate change impact, and that tackling flooding is associated with notions of adapting to changes in climate. The more precise interpretation of flood events as actually being climate change impacts is again not present, but is instead located in the future. The links between climate change and flooding are also explicitly made in the current government policy for flood issues and coastal erosion. The following extract taken from the most recent government strategy<sup>6</sup> on flooding is indicative of this.

We will be taking action to ensure that adaptability to climate change becomes an integral part of all flood and coastal erosion management decisions. (DEFRA 2005: 8)

This extract provides further evidence for the notion that flooding has come to be framed as a symptom of climate change. The link between flooding and climate change is conveyed through the assertion that there is a need for climate change impacts to be addressed in all decisions relating to the management of flooding (and coastal erosion)<sup>7</sup>. The DEFRA website also conveys a similar message with regard to the climate change framing.

Climate Change has the potential to increase probability of flooding due to increases in sea level and potential changes in the frequency, duration and intensity of storms. (DEFRA 2007b)

This statement is indicative of the uptake of knowledge relating to climate change in understandings of flooding. Below a similar statement taken from '*the Supplementary Note to Operating Authorities on Climate Change Impacts*' provides further insight into the policy-political framing of flooding as a climate change impact.

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<sup>6</sup> The most recent policy position is delivered in the government's first response to the consultation process conducted in 2004. The document is entitled, *Making Space for Water: Taking Forward a New Government Strategy for Flood and Coastal Erosion Risk Management in England* (2005).

<sup>7</sup> Coastal erosion is treated in conjunction with flooding in policy as it relates to coastal flooding. The interconnection between these issues is not addressed in this thesis with the focus instead being on the discourses about floods. This was a necessary part of narrowing the focus of the project. Coastal erosion is only referred to where it was mentioned in the data in relation to flooding. The relation between these issues is noted, however, and regarded as important in regard to coastal defence decisions.

Climate change impacts on flooding and coastal erosion are a challenge and risk for Defra and Operating Authorities (i.e. Environment Agency, Local Authorities and Internal Drainage Boards). (DEFRA 2006a: 1)

The existence of the note itself, and other government guidance with regard to climate change and flooding, is indicative of the policy framing of flooding in relation to climatic change. The content of such documents will form part of the analysis in subsequent chapters, for now the emergent frame is the focus. Within the policy-political sphere there is clear emphasis on the interconnections between flooding and climate change. Within local government there is also evidence of this discursive representation. The participant cited below manages local development and planning policy.<sup>8</sup> Here, they respond to the question; what is happening at the moment in planning policy, in terms of climate change and flooding?

In terms of climate change we've got this new post - which is temporary at the moment but hopefully we'll be making it permanent - which is going to be our climate change advisor to the council. This will involve tapping into her mind on climate change in terms of how we take the local development plan forward. It is early days. Again these are new areas really. (PLP Participant 15)

This participant depicted climate change as an emergent concern across many areas. Flooding was just one issue to be addressed within the wider remit of considering of climate change in planning. The connection between flooding and climate change was, however, still present. At this local level the discourse was less specific, although this may also be influenced by the more generic role held by the interviewee. All other interviewees had a role which was in some way specifically related to flooding or climate change, this participant held a generic role in terms of local development planning. The differences between local and national discourses and decisions are interesting areas of concern but the data derived from the study did not lend itself entirely to discussion on this point, although some observations are possible. The focus remains upon the nascent understanding of the issue as it is represented in the discourse.

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<sup>8</sup> The participant described the plans they are involved in developing: 'The local development plan has basically set out where we are going to plan future development like housing, industry, waste, there's a whole shopping list of land uses, you know, it sets out how we're going to develop those to 2021.' (PLP Participant 15)

From the data that have been laid out thus far, it is possible to see that there are clear associations between flooding and climate change being made in the policy-political sphere. There are many more examples of the explicit links drawn between the two issues in this domain but those already given are deemed sufficient in making the wider point. This depiction of flooding, as associated with climate change, has been prevalent throughout the wider discourse, in private and public organisations of varying kinds. The analysis thus moves forward now to expound the prevalence of this conception of flooding across a range of other institutions and organisations with involvement in flood issues.

As noted at the start of the chapter, climate change formed a topic for discussion in all of the interviews. The content and focus of those discussions varied but in all interviews the connections between climate change and flooding were made repeatedly. The participant below is defined for the purposes of analysis as affiliated with an independent organisation that has a role in relation to flooding. Here, they outline their views with regard to flooding, citing greenhouse gases and climate change as important in addressing floods.

Interviewer: What do you think are the major issues that have implications with regard to flooding?

Participant: I think it is unfortunately set to get worse with global warming. So, changing the way we live, changing the amount of greenhouse gases we make.

Interviewer: So do you think the increases in flooding we've experienced have been influenced by global climate change?

Participant: Well I think people are certainly becoming more aware of global climate change. Also there are a lot more studies being done about it but nothing is actually being done about it if you get my meaning [laughs].

(In. org Participant 10)

Here, the participant identifies climate change as a factor in escalating flooding. They explain their view that flooding is 'set to get worse with global warming'. For this participant, flooding is again depicted as associated with climate change. The participant when asked, however, did not cite the present flooding events as linked to climate change. Instead, their description indicates the expectation for flooding to get worse in the future due to climate change impacts. This is an interesting observation which relates to the questions in this thesis regarding the contrasts between the

conception of the issue and the present and proposed actions for tackling it in this context. This tendency for flooding to be situated as a climate change impact at some point in the future, but not at present, can be attributed through reference to Adam's (1998) notions regarding the difficulty for people in comprehending complex long-term issues, where causal connections cannot be clearly identified.

Adam (1998) asserts that in cases, such as global climate change, the time lag between cause and effects (amongst other aspects) creates difficulty in comprehension. There remains an ingrained expectation of proof via empirical observation and experimentation in determining 'hard' scientific knowledge. The complexities involved in achieving knowledge of climate change create difficulty in scientifically proving an empirically observable causal relationship between specific flooding events and global climate changes. These epistemic challenges can be seen as permeating the wider interpretation of the relationship between flooding and climate change. As noted, flooding is depicted as a climate change impact in the future, but present flooding events are not clearly defined in these same terms. It is suggested here, that this may be because of the difficulty found in making clear observable connections between climate change as a cause and flooding as an effect.

The following participant – classified as part of the academic community - delivers their views on how the links between climate change and flooding are made. They thus imply the inter-relation made with between these issues.

Interviewer: In your view how does the issue of climate change currently feature in the discourses and in the approaches to flooding?

Participant: It features in the DEFRA guidance to the EA in making allowances for climate change. In their environmental project appraisal guidance notes they provide estimations of climate change impacts. They provide advice to the local authorities on how you allow for sea level rise.  
(Acad. participant 11)

This participant designates the association between flooding and climate change as coming through the policy domain. Never-the-less they re-enforce the notion that there is a discursive link which is reasonably far-reaching. The connections between climate change and flooding continue to be made in similar ways throughout the interview data. Participants with differing roles and perspectives highlighted an

association between the issues. The example below, from a participant within the insurance sector, is indicative of this theme in the data.

Interviewer: Where in your view does the issue of climate change come into these discussions about flooding?

Participant: Well, it's absolutely fundamental in emphasising that we can't relax at all. In fact we probably need to be stepping it up several gears. We were very pleased that the Government commissioned the foresight report into flooding which I think gave us all pause for thought. (Ins. participant 9)

This interlocutor expresses the view that consideration of climate change is fundamental in relation to addressing flooding. Once again, it is possible to see how this representation of flooding carries beyond the political domain. Interestingly, the Association of British Insurers treat climate change as central to their concerns about flood risk. They are noted as investing in research with regard to the issue and even (possibly) influencing the political agenda. This point of interest will be returned to in the subsequent section of this chapter. This respondent also refers to the foresight report on future flooding; this is significant, because the links between climate change and flooding are perhaps nowhere more evident than in this report.

The report comes from the scientific community, with Sir David King the chief scientific advisor to HM Government, leading the project. This report offers an indication of a scientific interpretation of the relation between climate change and flooding. The foresight report on future flooding is an independent scientific study, which looks explicitly at the effects of climate change on flooding. Clearly, the understanding that flooding is associated with anthropogenic climate change is evident in this communication from, at least part of, the scientific community. The document authors draw on reports from the Intergovernmental Panel on Climate Change (IPCC) and the scenarios published by the United Kingdom Climate Impacts Programme for analysis. This is indicative of the flows between documents discussed earlier (chapter two) and the interplay of documents with the wider social world.

The foresight report on future flooding was produced as part of the foresight programme, which is an initiative of the state entitled *Foresight: Making the Future Work for you*. The programme was developed with the aim of increasing the 'UK

exploitation of science' and creating 'challenging visions of the future to ensure effective strategies now' (Foresight 2005). *Foresight* was initially announced in the 1993 White Paper *Realising Our Potential* and has subsequently been implemented through the development of various projects of which *Foresight: Future Flooding* is just one (Foresight 2005). The Foresight programme is run by the Office of Science and Technology and has two primary roles;

The Foresight programme either identifies potential opportunities for the economy or society from new science and technologies, or it considers how future science and technologies could address key future challenges for society. (Foresight 2005)

In the context of the latter role, a report was produced, outlining the extent of the threat that future flooding poses to Britain, and the possible responses to the issue. Key figures that have worked extensively in the field of flood management and related areas were brought together to contribute to the project and attempt to provide insights into the future challenges that are likely to arise.<sup>9</sup> The report has been hailed as 'the most wide-ranging analysis of the problem of increasing flood risk that has ever been made in the UK and possibly internationally' (King 2004a: 2). There is a clear focus in the foresight report on the effects of climate change on flooding. Two types of scenario are combined in the study in order to achieve, what is referred to as, 'a complete picture of future flood risk' (Evans et al 2004b: 18). These are 'socio-economic scenarios' and 'climate projections' based on 'emissions scenarios' (ibid.). Evans et al assert that this particular combination of scenario type is important, as;

Climate change will tend to affect the probability of floods occurring, whereas socio-economic factors will largely determine the cost of the resulting damage. Both are needed to provide a complete picture of future flood risk. (Evans et al 2004b: 18)

Here, Evans et al (2004) make a distinct and clear link between climate change and flooding. Flooding is quite clearly depicted as, to some extent, symptomatic of anthropogenic climate variation resulting from emissions. The effect of the report on actions and practice is called into question by some of the participants however this is

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<sup>9</sup> It is noted that there are many differing views within the scientific community and only one aspect is represented in the reports. Acad. Participant 7 suggests that the report was driven by the primary author Professor Edwards Evans and that his approach to understanding the problem is based on assumptions regarding the possibilities for macro scale modelling. It remains fair to suggest that the generic scientific view can be seen as broadly asserting links between flooding and climate change.

not the focus for now. At present the discussion relates to the framing of flooding as a symptom of climatic change. To continue with data that is classified here as affiliated with the scientific community, below an extract is cited from an interview with a climate scientist. They convey their views about the links between projected changes in the climate and flooding.

Interviewer: What in your view are the major issues that have implications for our capacity to deal with flooding?

Participant: We are talking about a changing risk in relation to climate change... we're interested not just in describing these climate impacts and risks, but also in helping people to adapt to what's going to happen. For flooding most of our stakeholders are already tied in to a response of some sort.  
(Sci. Participant 2)

This interviewee describes flooding as 'a changing risk' due to climate variation, clearly delineating flooding as a climate change impact. They also indicate how entrenched this climate change narrative is, suggesting that 'most stakeholders' are already responding to this understanding of the issue. Below, another participant classified as a scientist made the following observation.

If climate change and the presence of precipitation is the front end of the problem, the back end of the problem is how do you deal with the repercussions of the flood? (Sci. Participant 14)

The participant identifies a clear association between flooding and climate change, describing flooding as 'the back end' of the climate change problem. This participant expressed concern about the bracketing of climate change as a future problem. At the same time, however, when they talked about the relation between flooding and climate change they designated increases in flooding as a future concern, rather than relating present increases in flooding directly to human induced climate variation. These contrasts between how flooding is viewed abstractly as an issue connected to climate change but the specific flooding events are not attributed to climate change has been highlighted as an interesting aspect of the understanding of the issue. These nuances in the framing of flooding as a climate change impact have been explained through reference to Adam (1998).



There is a complex interplay between the scientific discourse and the wider social and political discourses. These discourses are not conceived as distinct from one another rather there is interplay between them and the differing spheres and institutions from which they arise. The construction of flooding as a climate change impact is seen to occur through the inter-section between different discourses in the social sphere. The participants are conceived as active in delineating flooding as associated with climate change in their day-to-day interactions and talk. A relatively stable characterisation or framing flooding as connected to climate change emerges from the complexities of the discourses.

In line with these assertions it is important to highlight that the distinction between 'communities' is not clear and there are overlaps between the political sphere, scientific community and private industry. Often individuals move between domains in their working roles and thus, networks which overlap are developed. This has been discussed in chapter two and is thus merely noted here. In addition to the interview participant's positioning of flooding as connected to climate change and the repeated references in the documentation, the contextual observation work provided a general sense of the significance of climate change for the contemporary conception of the problem.

In summary, it is asserted that in contemporary England (and Wales) flooding is conceptualised as a climate change impact. Analysis reveals important subtleties in the nascent understanding, relating to the temporal positioning of flooding as a climate impact *in the future*. This is in contrast to a delineation of flooding events of recent years as having been caused by climate change. This is noted as explicable in terms of the difficulties associated with making causal links between climate change and flooding events. The assumptions embedded within Newtonian scientific ways of knowing, like cause and effect, are asserted by Adam (1998) as permeating western industrial societies to their core. These assumptions can be posited as creating difficulty in making connections between particular flooding events and climate change as no direct causal relation can be drawn. These assertions relating to knowledge and climate change are expounded in greater detail at other points in the thesis.

For now it is concluded that climate change has come to feature prominently in the discourses through which flooding is delimited. This particular conception of flooding brings the long-term future into view and results in an understanding that floods will become worse. The evidence presented in this chapter provides some insight into the prevalence in the discourse of notions that flooding is connected with climate changes. The extracts from the data discussed give a broad overview of this particular narrative of flood.

In the introduction, the events of flooding in 1998 and 2000 were cited as significant in influencing the emergence of a contemporary understanding of flooding. The discussion of the data which supports this assertion will follow subsequently. It is important to note before proceeding, that there are additional knowledge(s) constituted in the discourses as important in the contemporary delineation of flooding as a social issue. These knowledge(s), to be discussed in a later section, relate to land use and practices of defending against floods. There are difficulties associated with such practices as they are seen to escalate flooding. These aspects of the problem are combined with the notion of flooding as a climate change impact to create a particular contemporary conception of the problem. The issues associated with land use and development, are noted as having been a relevant part of the understanding of flooding for some time. However, the emergent discourse wherein flooding is associated with climate change creates new difficulties with regard to such practices, as they are viewed in terms of a long-term future in which flooding worsens. This forms the subject of analysis later in the chapter. First, it is important to establish the significance of the flooding events in 1998 and 2000 for the emergence of the climate change frame.

### **Factors in the Emergence of the Frame**

The occurrences of floods in recent years are asserted as important in driving the emergence of this discursive representation of flooding as a climate change impact. This section examines some of the narratives in which it is suggested that recent flooding events have had an impact on the emergence of the frame. It is posited that these events of flood indicate a lack of control and the contemporary understanding of flooding can be seen as response to this. The focus for now is upon expounding the

notion that the nascent conception of flooding is a response to the flooding events in 1998 and 2000.

Before embarking on this analysis it is necessary to provide some brief background with regard to the flooding events which are proposed here as influential in the emergence of a different understanding of flooding. In 1998 Britain experienced some of the worst floods for many years. Severe floods affected several parts of the UK. The floods during the April of 1998 are of particular notoriety. Flood flow peaks for some parts of the UK exceeded all previously recorded peaks<sup>10</sup> (Saunders 1998). The extent and height of the floods has been ranked by some as 'the UK's worst flood disaster since the devastating spring floods of March 1947' (Saunders 1998: 1). In the worst affected regions the floods have been suggested as having been 1 in 150 year events. The floods began on the 9<sup>th</sup> April lasting 6 days and were caused by 'torrential downpours' on the 8<sup>th</sup> and 9<sup>th</sup> (ibid.). Saunders (1998) explains that 'more than 50mm (2 inches) of rain fell over a 130km swathe of the south midlands'. He notes that these rainfall totals were equivalent to more than nine weeks of rain in just two days. The insurance losses from the floods were estimated at 500-700 million making them the UK's fourth largest weather insurance loss on record.

Two years later in 2000 flooding events caused further devastation across the UK. The most notable of these were in the October and November of 2000 when windstorms triggered two weeks of widespread flooding. These floods were again reported to be 'the most severe since 1947' (Risk Management Solutions (RMS) 2000: 1). In reports the flooding was described as widespread with the most severe damages noted as having been in North-eastern England, North Wales, the Midlands and Southern England (ibid). Following these floods insurance costs were estimated at 500 million (RMS 2000). DEFRA (2006b) identify the floods that occurred in the autumn of 2000 as 'the most serious for many years' (DEFRA 2006b). DEFRA (ibid.) acknowledge that these floods 'may well have been unprecedented in duration and extent'. They also note the comparison with the 1947 floods but explain the difficulties in drawing comparisons with previous flooding events.

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<sup>10</sup> Start dates for records vary for different areas/ivers as do peak flows.

The previous flooding on this scale occurred in 1947 but direct comparisons are difficult as many flood defences have been built since then, but so too have many more premises. The flooding was the result of what proved to be the wettest autumn since records began in the 1700s; river catchments were saturated and did not hold water which therefore ran straight into rivers. (DEFRA 2006b)

Interestingly, the significance of development and flood defence is noted here but the floods are attributed to higher levels of rainfall. These practices are thus not conceived as causing the floods but are noted as significant in being able to determine the scale of the floods. Despite the difficulties in comparing flood levels the 1998 and 2000 floods were undoubtedly significant events<sup>11</sup>. The nascent discourse through which the problem of flooding is now shaped is asserted as a societal reaction to these floods which affected major parts of England and Wales.

The significance of the 1998 and 2000 floods is highlighted in research conducted by the Flood Hazard Research Centre. A study entitled '*Crises as Catalysts for Adaptation: Human Response to Major Floods*' examines the impact of the 1998 and 2000 floods on policy changes (Johnson, Tunstall and Penning-Rowsell 2004). In the report Johnson et al (2004) examine flood crises as catalysts for policy change. In this study the 1998 and 2000 floods form two of their four disaster case studies. The importance of these floods in driving the policy re-framing or rather in increasing the emphasis on certain factors is proposed by some of the participants in their study. The significance of these floods for the emergence of an understanding of flooding as related to climate change is noted in their analyses, although they take a critical realist position with regard to these observations.

In this thesis, as explained previously, a constructivist stance is adopted. The contemporary understanding of flooding as related to anthropogenic climate change is viewed as being achieved through social processes. The knowledge relating to climate change itself is not seen as a direct reflection of some observed reality. Rather, it is conceived as mediated through particular ways of seeing and understanding specific to the contemporary era. This should not be taken as diminishing the 'reality' of the

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<sup>11</sup> As highlighted in the introduction there have been major incidents of flooding since the events, most notably the floods in 2003 and 2007. It is these earlier floods in close temporal proximity that are asserted to have been influential in driving the emergence of the contemporary framing which continues to be prevalent in the discourses.

issue. As detailed in chapter two, suggesting that knowledge creation involves subjective construction does not diminish the worth or validity of such knowledge. It is merely to accept a particular understanding of knowledge creation itself.

The uptake of knowledge about climate change in relation to constructing flooding as a contemporary problem is viewed as being achieved through complex social processes involving the attribution of particular knowledge(s) and ways of seeing to achieve understanding of phenomena. This does not mean for the author here that floods are not real *per se*; they happen and have effects that are real for people. However, the way in which those instances are understood, is open to mediation through social processes and relates to choices regarding the knowledge(s) drawn upon to inform understanding. These occurrences can thus be understood in a range of differing and even competing ways. This position does not constitute a particularly strong constructivist position instead it falls somewhere closer to the middle of the continuum (as discussed in chapter two)<sup>12</sup>.

The knowledge of climate change is seen as having become a more integral part of the discourse following the flood events discussed earlier. Institutions, or rather social actors within them, utilise this knowledge in creating a particular understanding of flooding, which can be seen as having become dominant. Knowledge connecting climate change and flooding has been produced previously. Yet, it was not until serious flooding events occurred that a more extensive change in the representation of floods developed. Occurrences of flooding in subsequent years, have apparently added weight to this emergent discourse, which is interpreted on some level as an indication that the effects of climate change are beginning to be seen. These notions, regarding the emergent nature of this discursive representation of flooding, are supported by the data. The quote below is an example wherein the events of flood are highlighted as having born an influence on the discourse.

The increase [in funding] in the past three years was due to the 1998 and 2000 floods, because two major floods this close together persuaded politicians that there was a problem and it was most likely the result of climate change. (Acad. Participant 11)

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<sup>12</sup> Irwin (2001) explains that this moderate stance is true of most constructivist approaches in the study of environmental issues.

The participant notes that the flooding events acted as a catalyst for the stronger associations between flooding and climate change. The significance of both the severity and close temporal proximity of these flooding events was noted by other participants in the study. The participant cited below makes a similar observation with regard to the recent nature of this shift. They highlight the growing representation of flooding as a climate change impact.

More recently it's sort of on the front sheet now because I think it was something that was talked about in general terms a few years ago but now there's a positive drive towards building into anything that we do the prospect of climate change, although it's still a bit of an unknown really. I think it was a nice thing for politicians to clutch onto following the 1998 and 2000 floods (Pol. Participant 13)

This participant refers to the 'more recent' push, towards incorporating consideration of climate change in approaches to tackling flooding. Political institutions are depicted as taking a role in explaining the floods. The occurrences of flooding events in close proximity are positioned as marking a drive towards a more explicit and applied inclusion of knowledge regarding climate change in understanding flooding. The participant cited above also indicated a cynicism regarding the political motivations for taking up knowledge(s) relating to climate change. Disputes are particularly apparent with regard to this aspect of the framing. These may be seen as explicable in terms of ingrained notions regarding the creation of knowledge. The constitution of knowledge relating to anthropogenic climate change is noted as involving multiple indeterminacies. Notions of observable and traceable relations of cause and effect in scientific knowledge creation are noted by Adam (1998) as continuing to permeate thought industrial societies.

Below a further extract indicates the effect that the 'recent extreme weather events' have had in the emergence of the contemporary understanding.

Recent extreme weather events, having large societal and economic impacts have prompted the debate about effects of human activity on the world's climate.... We focus particularly on the United Kingdom Autumn 2000 floods because, aside from causing widespread damage, they occurred during the wettest autumn since records began in 1766. (WWF 2006)

This statement, taken from the World Wildlife Fund (WWF) website, is demonstrative, both of the links that are being made between flooding and climate change, and the impact that recent flooding events have had upon the emergence of this representation. It is interesting, that despite the emergence of this understanding of floods having been driven by the 1998 and 2000 floods, the majority of participants were reluctant to suggest that these floods were due to climate change. At the same time, participants identified climate change as a factor in causing or exacerbating floods. The depiction of flooding as a climate change impact was frequently consigned to the future, rather than the present domain. Thus, while no participants suggested that the 1998 and 2000 floods – or any other recent flooding events – were attributable to climate change, they associated the nascent understanding of flooding as a climate change impact to these very events.

Johnson, Tunstall and Penning-Rowsell (2004) in their discussion of the contextual factors which influenced the ‘issues raised and policies implemented’ in relation to the floods, note the emphasis on climate change in concerns expressed after the 1998 floods. The 2000 floods, however, are cited as the most significant catalyst for the climate change explanation. They conclude that ‘it was after the events of autumn 2000 that climate change began to be more widely raised as a factor to explain the recurrence of major flooding’ (Johnson, Tunstall and Penning-Rowsell 2004: 108). The research suggests therefore, that the 1998 and 2000 floods can be seen to have had a significant impact on the emergence of a far greater adherence to a climate change frame. Here, this nascent understanding is seen as a response to the lack of control which these floods indicated. Previously available knowledge(s) are drawn upon to explain and create an understanding of the problem reconstituting it in a particular way so that a new solution can be presented.

The insurance sector is noted as having a role in the emergence of the climate change frame. A participant working within the insurance sector described the role of the Association of British Insurers, post the 1998 and 2000 floods, in influencing the agenda. They explain,

There were very real risks of insurers saying “we don’t understand enough about this, we can’t insure what we don’t understand and so there’s going to be some areas of the country that won’t get cover”. (Ins. Participant 9)

The story this participant conveys is of interest in allowing the reader insight into processes, which may have been influential in the particular emergent understanding of flooding as climate change impact. They outline how the Association of British Insurers ‘initially had an agenda of three key issues that needed to get sorted out’, These are listed as being; a long term capital investment programme; a streamlining of the bodies involved in decision-making with regard to flooding (noted to have involved over 700 bodies at the time); and a reassessment of the planning guidance that Office of the Deputy Prime Minister (ODPM)<sup>13</sup> provides. The participant explained how the number of new houses that were going to be built in flood risk areas was an issue of concern for insurers. These concerns were cited by participants as prompting the Association of British Insurers involvement in the policy processes. One participant suggested that their involvement within Whitehall and beyond acted as ‘a bit of catalyst’ in influencing the debate regarding flooding (Ins. Participant 9). The financial aspects relating to the economic cost of the floods can thus be seen as important in pushing the issue up the political agenda.

In insurance terms flood risk in the UK was considered to be a reasonably low risk for many areas and was included as part of normal household insurance.<sup>14</sup> The floods in 1998 and again in 2000 thus represented a failure in the risk-based predictive capacity of insurance companies. It represented a large enough concern for a participant to outline the ‘very real risk of insurers saying.... we can’t insure what we don’t understand’ (Ins. Participant 9). The implication here is that the lack of predictability and failure of probability estimations, equates to a failure to properly understand the problem. It is suggested that in this context climate change arises as an available discursive explanation for the apparently unexpected increases in flooding.

The Association of British Insurers takes a relatively strong position in relation to climate change and the effect it has on flooding. It is perhaps indicative of the concern

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<sup>13</sup> Since the interviews there have been changes in the roles and titles of Government departments. ODPM is noted as now being called ‘Communities and Local Government’.

<sup>14</sup> Over half a million homes are now at high flood risk – up over 100% in the last five years. (ABI 2007b)



the Association of British Insurers has with regard to climate change that there were more direct mentions of “climate change” in interviews with participants from the insurance sector than in any other category of interviewees. The Association of British Insurers requires ‘a 0.5% annual probability that’s 1 in 200 years, which is taking account of climate change’ (Ins. Participant 9). This is highlighted as being ‘a fairly high standard’ (ibid.). Another participant from within the insurance sector noted in discussion, that the insurance company they worked for would not insure below a 1 in 1000 flood risk; significantly higher than Association of British Insurers expectations (Ins. Participant 18). It is worth noting, at this point, that the Environment Agency requires only a 1 in 100 year probability for flood risk. An account of the difficulties this discrepancy can cause for new developments will be outlined in a later chapter. Below further indications of the insurance sectors concerns with regard to flooding and the association with climate change are apparent. In this interview extract the participant is replying to a question regarding the flood risk that insurers are prepared accept.

These are customers that we’ve been insuring for years, we’re not suddenly going to turn around and walk away from them, but these new buildings we have no commitments to anybody there. We know the situation is going to get worse with climate change. We don’t want to come on cover now for something that we will decide is uninsurable in the future (Ins. Participant 9)

Here, the participant makes links between flood risk and climate change. The emphasis is on future flood risk and the potential for uninsurable properties, due to increased flood probabilities because of climate change. Further indications of the concern in the insurance sector, with regard to climate change, can be found in the documentation of the Association of British Insurers and on their website. Their announcement for their forthcoming annual conference finds climate change described as one ‘of the key issues facing the industry and wider society’ (ABI 2007a). Additionally, the industry appears to have made reasonably significant investments in climate change research.

It is suggested that knowledge relating flooding to climate change is taken up in response to the occurrences of floods in 1998 and again in 2000. Significantly, it appears that the two events together were the catalyst for the heightened emphasis on

knowledge relating to climate change for understanding flooding. It is thus asserted that it is after 2000 that a clearer emphasis upon climate change in relation to flooding arises. This understanding of flooding as climate change impact is evident throughout the expert or institutional discourses. However, the insurance sector and the policy domain appear to have been particularly influential proponents in this constitution of the problem. Complex interplays between the differing domains, including for example the insurance, policy and scientific arenas, are evident in the processes through which flooding has come to be established as a climate change impact.

The following section entails analysis of the discourses in which difficulties associated with hard flood defences and land development are raised. The notion of developing to suit and defending against floods has come to be formulated as part of the problem. These practices can also be seen as integral to the *solutions* posed for flooding. The way in which land is utilised and development conducted is central to the proposed solutions. It is suggested that knowledge(s) of the difficulties associated with development and flood defence have been part of the formulation of the problem for some time. However, once flooding is conceived as a climate change impact these issues take on new relevance as they come to be viewed with an eye to the long-term future. The difficulties highlighted with regard to these issues are exacerbated by the notion that flooding will worsen with climate change.

This means that at the same time as significant increases in flooding come to be expected, the solution (i.e. structural engineering of natural systems to control flooding) is no longer viewed as an acceptable way of tackling the issues. Flood defence comes to be seen as increasingly inadequate when the long-term effects of climate change are considered. In addition, historical development practices, as well as the constant pressures for more development, make notions of abandoning flood defence strategies difficult to conceive. Development in flood plain areas is also seen to have an effect in escalating flooding. Thus, practices of development integral to contemporary capitalist societies come to be understood as part of the problem. These complex issues discussed in the interviews are examined in the following section.

### **Land Development and Hard Decisions**

Difficulties have been identified with flood defences and particular land-use practices (e.g. development in flood plains). Hard engineering approaches to flood defence are now recognized as having negative impacts upon flood risk and the environment. Flood defences that might be labelled 'hard' include, embankments, sea walls, dams and so forth. These 'hard' flood defences are often contrasted with 'softer' solutions such as, beach nourishment or managed realignment.<sup>15</sup> In addition, the notion of protecting from floods through defence has come to be viewed as uneconomic. Notions of 'holding the line' are understood as increasingly problematic when knowledge of climate change is taken into account. Land use practices have also been cited as a concern in relation to flooding. For example, developments in flood plains are identified as heightening the likelihood of floods. In addition, industrial farming practices are understood to escalate flooding. Moreover, the pressures placed on drainage and sewerage systems by buildings are highlighted as an issue with regard to flooding. Analysis of the interview data and documents reveals evidence of the importance of these concerns in understanding flooding as a contemporary problem.

The identification of the difficulties associated with strategies of flood defences is important in outlining the contemporary understanding of the issue. The House of Commons Select Committee Report on Agriculture (SCA) published in July 1998, provides a good initial indication of the nature of the discourse through which flooding is constructed as a problem. The select committee asked for 'information from interested parties' in March 1998; they received 'over 70 memoranda from a variety of organisations and individuals, and held five oral evidence sessions at Westminster' (Select Committee on Agriculture 1998: 13). The committee also made visits to coastal and river sites in the east of England. The resulting report is regarded as indicative of the discursive representation of the flooding problem.

The report outlines clear concerns regarding the problematic nature of hard engineering structures as a solution to flooding. The extract below provides an indication the difficulties that hard defences present. The issue of climate change is

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<sup>15</sup> This is a very general depiction of flood defences options and schemes. Flood defence solutions vary for coastal and estuarial flooding and river flooding, and are multiple.

given less emphasis in this report. However, this is posed as relevant to the time at which the report was published i.e. prior to the 2000 floods which were significant in the emergent understanding of flooding as a climate change impact. The issues with hard flood defence are such that these are seen as escalating flooding regardless of climate change and are also viewed negatively in environmental terms. The report is worth citing at some length.

Despite the threats posed by a warming global climate, much of the evidence we heard suggested that the most immediate source of increased risk from flood and erosion arose not from environmental and climatic change, but from a heritage of hard engineered flood defence structures. For example, the provision of coastal defences at Sea Palling on the east Norfolk<sup>16</sup> coast has caused a decrease in sediment availability to the south, necessitating the construction of further defence works there. In the case of inland river systems, we have heard from witnesses that development on flood plains, including the construction of hard flood defences, invariably results in the loss of water storage in these areas which, during storm events, increases downstream flood risk. (Select Committee on Agriculture 1998: 36)

Engineered flood defences and development of flood plains, including any associated structural changes for flood defence, are highlighted as part of the problem with regard to flooding. Flooding is, in this respect, located as an issue which cannot be solved through structural engineering to protect development. This raises significant difficulties as development is integral to contemporary capitalist society as such there are associated pressures for continuing such practices. The notion of developing and defending has come to be seen as part of the cause of flooding, rather than floods being viewed as an external threat from nature that can be protected against.

The negative impacts of hard flood defences in both coastal and river areas are highlighted in this report. Indeed, the problems that defences pose are suggested to represent a greater *immediate* threat with regard to increasing flood risk than climate change. Here, the problematic nature of hard defensive strategies has been identified as an important part of the discourse. It is suggested that the concerns relating to engineered flood defences are significant in the contemporary framing of flooding as

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<sup>16</sup> Where publicly available documents are cited the place names are not converted to pseudonyms. Pseudonyms for areas are only utilised in places where the participants have talked about locations that may lead to their identification. Where major cities such as London and Cardiff are referred to pseudonyms are not utilised as the identification of participants from such references was felt to be highly unlikely.

a social problem. It is important not least because it represents a strong critique of previously accepted strategies for dealing with flooding. In citing one of their witnesses (the Wildlife trusts and WWF) the select committee report states further;

Flood and coastal defence has too often been synonymous with the destruction of wetland and coastal habitats. Ironically, it has also undermined the sustainability of defences and increased risks by encouraging development in flood plains and erosion zones (the Wildlife Trust and WWF cited in SLCA sixth report 1998: 97).

In this quote, the difficulties associated with strategies of engineered flood defence and land use are again identified. The two issues are depicted as interconnected with the construction of hard flood defences being noted as a factor in encouraging development in 'flood plains and erosion zones' (ibid.). This assessment of the relationship can be reversed in that building in flood plains can be seen as requiring flood defence. The invention of flood defence arises as a solution to a problem associated with historical needs to build near water. Understood either way the contemporary situation is characterised as one whereby the practices of development in flood plains and engineering defence, are viewed as part of the problem with regard to flooding.

The significance of such practices is identified in this study as important in the delineation of flooding as a contemporary problem. These issues are however heightened once flooding is conceptualised as a climate change impact and is thus expected to worsen. It is important to note that as distinct aspects of the issue of flooding, the knowledge(s) drawn upon to formulate the problem entail differing temporalities. The knowledge relating to the difficulties with engineered flood defence structures and development is distinct from that of climate change in that traceable and direct causal links are possible. In this sense, these issues are different to climate change in that knowledge relating to them does not contrast with ingrained notions of linear cause and effect. The temporal differences which have bearing on the knowledge(s) through which flooding is understood are significant. The association with climate change heightens uncertainties in relation to flooding in particular ways not true of the other aspects of the framing.

Both the 1993 *Strategy for Flood and Coastal Defence* (Ministry of Agriculture, Fisheries and Food, MAFF and the Welsh Office, WO 1993) and the 2005 Government first response *Making Space for Water: Taking Forward a New Government Strategy for Flood and Coastal Erosion Risk Management in England* (DEFRA 2005) reveal the importance of these concerns around land-use and hard flood defence in relation to the contemporary framing of flooding. The difficulties that development processes create in relation to flooding are treated with greater significance in the 2005 policy, but there is a clear identification of these problems in the 1993 strategy.

The 2005 strategy is analysed in this thesis as a source for identifying the particular understanding of flooding as a contemporary problem, and for the proposed solution that are viewed as influenced by this particular representation of the issue. The analysis of *Making Space for Water* will form part of the next section in which the contemporary framing of the problem is considered in relation to the emergent approach for tackling flooding. For now, the focus remains on the significance of land-use issues and concerns about hard flood defences in defining the problem.

In the 1993 policy document entitled the *Strategy for Flood and Coastal Defence*, there is clear evidence of the discourse regarding human interference with ecological systems increasing flood risk. The extract cited below provides delineation of these concerns as they appear in the policy document.

Past defences, built in response to contemporary need to protect important assets, were based on the best available technology at the time. Although such defences have an important socio-economic purpose we now know that they also have had, in a number of cases an adverse impact on the environment. Some defences have confined rivers to fixed channels, damaging the natural river environment and preventing rivers from migrating naturally across flood plains. Intertidal areas have been reduced by the construction of sea defences which have allowed the land behind to be drained for agriculture or development. Saltmarsh and mudflats absorb wave energy, and fens and low lying marsh provide natural washlands to hold flood waters and slow the rate of flow to rivers. The valuable contribution these and other habitats can make to flood protection has thus been lost in many areas. (MAFF and WO 1993: 11)

In this extract, strategies involving hard flood defences are regarded critically for their role in diminishing natural defences and damaging the environment. There are

attempts in the 1993 strategy to apply this knowledge, resulting in the suggestion that flooding cannot be defended against and that new ways of addressing the issues are required. For example, it is stated;

Over the last two centuries people have turned to engineered structures to maintain the coastline by opposing the natural forces of the sea. It is now becoming better understood that some of these techniques can cause problems either locally or at other points along the coast. Attention has therefore been turned to adapting and supplementing natural coastal processes, with the aim of creating a more environmentally acceptable and sustainable coastline, for example beach nourishment. This approach has come to be known as 'soft' engineering. However, given the diversity of the coastline, no one method of defence will hold good in all circumstances; hard defences will continue to be appropriate in many cases. (MAFF and WO 1993: 14)

The difficulties regarding engineered structures in relation to coastal flooding are identified. The recognition of these difficulties with previously accepted solutions to flood defence is related more to the environmental damage they cause than to notions that they may not be adequate to protect from flooding. The climate change discourse brings into question the extent to which defences represent a solution to the problems for the long term. This notion will be discussed subsequently. In the quote above despite the clear acknowledgement of the problems that technologies which work against nature have caused, there is a continuing focus on the need for hard flood defences; 'hard flood defences will continue to be appropriate in many cases' (MAFF and WO 1993: 14).

In the most recent policy *Making Space for Water* there is a much clearer focus on the difficulties engendered by hard engineering approaches and the immense difficulties associated with controlling flooding. Despite there being discussion of arising knowledge indicative of a need for a change in the 1993 *Strategy for Flood and Coastal Defence*, there is limited application of this knowledge. It is suggested that the difficulties, which have become apparent in relation to hard flood defences and land use practices, have formed an important part of the wider discourse around flooding for some time. However, the impact of these discourses has come to be felt more strongly in recent times.

The participants discussed these problems associated with land use and hard flood defences. They also provided indications of the significance of knowledge(s) relating to these issues with regard to understanding flooding as a contemporary problem. The participant cited below, for example, iterates the significance of the difficulties associated with land use and development in the denotation of flooding as a problem.

Clearly in the past there's been a significant amount of inappropriate development in the flood plain and that is a big issue' (Pol. Participant 5).

Development in flood plains has been cited as a major factor in increasing flood risk. There are multiple reasons for this, including the lessening of permeable land and obstruction of areas where water could freely flow. The participant below outlines the significance of development in escalating flooding.

When you build properties on the flood plain, even if you build those properties such that they are themselves flood resistant... you may have properties upstream... and there property becomes more prone to flooding. (Acad. Participant 7)

This participant explains how development in flood plains increases the likelihood of flooding in other areas. Put simply, water runs to the point of least resistance, thus if you have placed a wall, barrier, or development of some kind, at one point along a river, the water is pushed to the next point of least resistance - where other development may be. Development in flood plain areas is therefore problematic in the sense of increasing flood risk generally. Moreover, it is likely that houses built in the flood plain will be more prone to flooding. Below, another participant denotes development on the flood plain as an issue.

Interviewer: From your perspective what are the major issues with regard to flooding in England and Wales?

Participant: Well, I think the legacy of development on the flood plain is a major issue. (Pol. Participant 6)

Land-use and in particular the legacy of development is identified as a significant concern in addressing flooding. In the UK there has been a long history of development and building in flood plains and coastal areas. Many of the major cities in the UK are situated close to coastal areas; London and Cardiff are two prominent examples. There are quite clearly multiple pragmatic reasons for the location of cities



close to the sea, not least that the UK is an island meaning that no-where is particularly far from the coast.<sup>17</sup> This trend in historical development is an important part of problem.

Several other participants identified prior and continuing development as a significant issue in relation to addressing flooding. This participant refers to the necessity to discontinue building to an historic formula.

...addressing local small scale drainage and that's something that needs thinking about and not just building according to a historic formula, sort of sustainable urban drainage and the problem that we're concreting over so much land surface. (Sci. participant 2)

This participant highlights the pressures that continuing development place on flood management; this is identified as a point of tension. Development is at one time a cause of flooding and an important activity in contemporary capitalist societies. The tensions that exist in regard to the contemporary understanding and the implementation of measures required to address flooding in this new context will be discussed in later chapters (see chapter six and seven). The concerns about land-use and hard flood defences were found to be present in every facet of the discourse relating to the flooding. There was also dispute regarding the extent to which policy acknowledgment of these issues translates into physical changes in practices. The continuation of development in flood zones was repeatedly cited as a concern. This discussion will, as has already been noted, be postponed for later in the thesis. For now the framing of flooding as a social problem is the focus.

Thus far the difficulties associated with hard defences and development practices have been discussed as distinct from that of global climate change. The implications of the association with climate change for these difficulties with regard to flooding has been noted but not explicated. It is important to draw these major parts of the contemporary understanding of flooding together. The increasing focus on climate change brings these issues with land use and flood defence into view as posing heightened difficulties.

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<sup>17</sup> Other factors, such as international trade were obviously significant in the original locating of now important cities.

Concerns about development escalating flooding are heightened by the notion that flooding is going to increase due to climate variation. Hard flood defences, allowing for development in flood plains, come to appear as increasingly inadequate in light of the problems they cause - these issues seem more significant with the lens of the long-term future turned on them. The notion of building higher and higher walls seems wholly inadequate from this long-term perspective, in which flooding worsens with climate change impacts. The participants highlighted this difficulty in maintaining flood defences as a solution when flooding is expected to worsen with climate change. This participant classified as a political actor explains that in this context 'we can't simply build higher walls' (Pol. Participant 6). The prospect of ever continuing development appears equally difficult to uphold once the long-term future is in view. The participant below highlights similar issues with regard to notions of developing and defending against flooding.

I think it [flood defence] should be the last resort and the reason I say that is because flood defences built in England and Wales will be over topped at some point in the future... if climate change really does make things an awful lot worse. (Sci. Participant 2)

The knowledge(s) relating to the role of climate change in escalating flooding for the future makes problematic notions of flood defence as walls are expected to be 'over topped'. The interplay between the three areas of concern - climate change, land use and flood defence – is significant in understanding the contemporary conception of flooding. The notion that flooding is going to get considerably worse with climate change alters the way the issue is conceived. Floods are no longer considered as isolated, natural disasters but as an increasing threat, which requires a long-term approach if it is to be effectively tackled. Hard flood defences, identified as a previously accepted solution to flooding are depicted as no longer adequate. This is both because of the knowledge that they cause ecological damage and escalate flooding *and* because they appear as an unsustainable solution for the long-term future in light of climate change. The answers in this difficult context are not easy to determine, however, as flood defences do play a role in preventing flooding. The final quote below taken from the 1998 Select Committee Report on Agriculture, introduced earlier in this section, provides an overview of the context for tackling flooding.

We are of the opinion that flood and coastal defence policy cannot be sustained in the long term if it continues to be founded on the practice of substantial human intervention in the natural processes of flooding and erosion. Indeed, it is of great concern to us that the legacy of flooding and erosional problems arising from this practice - and the likely increase in future of climatological and other environmental pressures on the UK's ageing flood and coastal defence infrastructure - might combine to present flood and coastal defence authorities with insuperable difficulties. (Select Committee on Agriculture 1998: 9)

In this quote, the three prominent aspects are referred to that have been highlighted as informing the contemporary framing of flooding as a problem. The interconnectedness of these problems is clearly identified in this statement. As previously noted climate change has become more important in the discourse since this select committee enquiry. The significance of these knowledge(s) for delineating flooding as an issue in contemporary England and Wales is apparent in all of the documents analysed in this study and the interview data. The analysis that has been laid out here provides insight into this, through the presentation of extracts from the interview data and document analysis. This particular conception of the issue is contested but forms a dominant representation of the problem, particularly in policy domains. The capacities to address flooding (once it is understood in this context) are the subject of later chapters. Questions are posed regarding the contemporary capacities to deal with the issues in a way aligned with the particular contemporary knowledge(s) through which the issue is understood as a problem.

The contours of the contemporary anatomy of the issue have been laid out here as relating to particular knowledge(s). It is suggested that most significant in the contemporary understanding is the nascent demarcation of flooding as a climate change impact. This has implications for how contemporary practices and solutions to the issue are viewed. Flooding is framed not just in terms of a long-term future, which involves climate change, but also as an issue for which solutions previously found adequate are now problematic. Land-use practices, such as building on flood plains, and hard flood defences appear unsustainable in light of particular contemporary knowledge(s). These knowledge(s) are taken up in the discourses and utilised in defining flooding as a contemporary problem. The significance of these concerns in framing the flooding problem appears to have been highly influential in shaping the

new policy direction. The following chapter will be dedicated to an examination of the particular understanding of the flooding problem in relation to the approach advocated for tackling the issue. This approach is delineated as a 'risk management' approach to flooding. The invocation of the language and conceptual reasoning of risk is thus the focus of the next chapter. Later (in chapter eight) the significance of risk for contemporary society is analysed conceptually in an effort to elucidate the emergence of this discourse in relation to flooding.

### **Concluding Remarks**

This chapter has entailed an examination of the framing of flooding as a social problem. It has been asserted that the issue is understood in a way specific to the contemporary era.<sup>18</sup> Knowledge(s) relating to climate change, land use practices and flood defence have been shown to be intertwined to create a framing of the issue which can be seen as particular to the contemporary age. This framing is in turn asserted as having been influenced by a need to explain the failure in predicative capacities and lack of control that the recent increases in flooding events appear to represent. The differing discourses associated with distinct institutional domains are seen as intersecting in complex ways to create a relatively stable construction of the issue as a social problem.

The locating of flooding as a climate change impact in the future domain has also been highlighted as a point of interest. It was briefly noted that this may be explained through the prevalence of ingrained notions of cause and effect with regard to establishing knowledge (Adam 1998). Despite advances in terms of what constitutes knowledge, such as the development of complexity theories, such embedded notions of causality can be seen as remaining. Thus, and although the 1998 and 2000 flooding events appear to have been a catalyst for the climate change frame, recent or present flooding events were not characterised as climate change impacts. The notion of floods being climate change impacts was postponed for the future. Flooding appears to be delineated as a natural hazard first, which will subsequently be heightened by

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<sup>18</sup> The claims made here are not intended to be generalised beyond England and Wales where the empirical research took place.

human-induced changes in the climate. These complexities in the frame are important in establishing a more nuanced understanding of the representation of flooding.

The understanding of flooding delineated in this chapter is significant and forms the basis for the subsequent discussion. It is important to recognise that the 'framing' is contested and the more complex nature of the issues relating to how flooding is understood are revealed through the thesis. The departure point for analysis, however, are questions pertaining to the capacities for implementing changes or new approaches that correspond to this dominant contemporary understanding of the problem. The contested nature of the contemporary understanding is seen to relate to the difficulties that are to be faced in applying such an understanding of a problem. The questions in this thesis pertain to the application in practices of this understanding of flooding and thus of the knowledge(s) drawn upon to inform it.

A contrast became evident through the research whereby, while flooding has come to be contextualised as a symptom of climate variation, this is not necessarily indicative of a change in actions with regard to flooding. There were varying accounts within the data of the extent to which the knowledge(s) drawn on to inform the social framing have really infiltrated at a practical level with regard to flooding. This will be discussed at a later point in the thesis (chapter six). At present, the prevalence of a particular contemporary conception of flooding in England and Wales is noted as highly significant.

Flooding, understood as climate change impact, implies the necessity for new and innovative means of coping with the problem. Flood defence appears as no longer an adequate solution once the long-term future is bought into view. The proposals for solution put forward in the new policy strategy are discussed in the following chapter. In the next chapter an emergent discourse of risk in relation to flooding is identified. Flooding comes to be increasingly represented in terms of risk entailing a heightened emphasis on risk calculation as a means of achieving knowledge about flooding. The notion of 'risk' in relation to flooding appears to be unquestioned as an appropriate conceptual tool for addressing flooding understood in the context delineated above.

This nascent discourse of risk with regard to flooding is an important focus of this thesis. In light of this discourse, 'risk', as a conceptual and methodological tool for tackling flooding, is the subject of scrutiny. The emergence or increasingly pervasive nature of a discourse risk with regard to flooding is posed as particularly interesting given the relation between flooding and climate change. A strategy of risk management, underpinned by risk calculation, is positioned as part of the shift in understanding the problem and establishing solutions initiated due to the occurrences of floods in 1998 and 2000.



## Chapter Five

### Discourses of Risk: Managing Floods

Until quite recently, risk was confined principally to insurance and financial transactions. As such, actuaries and traders of various kinds spoke in the language of risk. With respect to the environment, an area in which decisions of risk now loom especially large, problems were conventionally cast in relatively straightforward terms, say cleaning up a contaminated river or ridding the air of visible pollutants... this is no longer the case. (Cohen 2000: 4)

‘There is method here, precise, relentless and 100 per cent man-made’  
(Arundhati Roy 1999: 26)

Risk management is much more than a technical analytical practice; it also embodies significant values and ideals, not least of accountability. (Power 2004: 11)

### **Introduction**

It has become evident from the analysis that as flooding has come to be understood in the context addressed in the previous chapter, it has also come to be increasingly represented in terms of risk. The understanding of flooding as a contemporary problem was mapped according to three primary intersecting discourses; that of climate change, inappropriate land use (including issues regarding high development), and the inadequacy of hard flood defences. It was suggested that these three concerns intersect to create an understanding of flooding as a problem which is specific to the contemporary age<sup>1</sup>. At the same time that this understanding of the issue has emerged, flooding has come to be framed in terms of risk. In the previous chapter, the increasingly pervasive nature of the language of risk in relation to flooding was not expounded. This will be the focus of the discussion to follow here.

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<sup>1</sup> The assertions here are stated in the opening chapters as not extending beyond England and Wales where the empirical research was conducted.

Some commentators locate the shift to understanding flooding in terms of risk as occurring sometime around the 1980's (Johnson, Tunstall, and Penning-Rowsell 2004). From this research it is apparent that in more recent years there has been an increasing use of risk assessment, with more complex models for analysing flood risk being developed. In addition, a discourse of risk management has emerged. The nascent discourse of risk is evident in the new policy and in the wider discourses around flooding. It is primarily apparent in a shift to notions of flood risk management, in contrast to flood defence, although there is also a heightened focus on risk calculation for decision-making. The conceptual implications of and reasons for this shift in the discourses are of significant interest for this thesis and will be addressed with reference to sociological literature in later chapters.

The focus for this chapter is upon first, highlighting the emergence of a more pervasive risk discourse in relation to flooding and secondly, on the meaning and connotations of this discursive shift. The works of Adams (1995), Adam (1998), Horlick-Jones (1998) and Power (2004) (amongst others) will be examined for their interpretations of discourses of risk and risk management. Discussion of these theoretical works will be laid out with the empirical analysis to provide sociological insight into the emergent discourse of risk and risk management in relation to flooding. Past and present policy documents will be analysed in pursuit of these aims, as will the interview data.

### **Understanding Risk Management**

The risk-based approach to organisational life is conspicuous. Not only private sector companies, but hospitals, schools, universities and many other public organisations, including the very highest levels of central government, have all been invaded to varying degrees by ideas about risk and its management. (Power 2004: 9)

The prevalence of a risk-based approach to contemporary issues has been highlighted by numerous commentators who have noted the increase in risk assessment and risk management practices over the past few decades (Beck 1992a; Luhmann 1993; Adams 1995; Slovic 1998; Lupton 1999a; Power 2004). Beck (1992a) has designated



contemporary societies as 'risk societies'. Luhmann (1993) highlights the increasing prevalence of interpretation of issues in terms of risk. Power (2004: 9) explains that 'risks management and risk talk are all around us'. A multitude of other authors, too many to name here, have all noted the apparent significance of risk culture for contemporary society. As might be expected there are notable differences in approaches to and perspectives of this phenomenon.

Power (2004) distinguishes between questions of conceptual clarity in relation to risk and questions concerning how risk materialises in social and economic institutions. The works of Beck and Luhmann (discussed in chapter three) can provide some conceptual clarity to the concept. Luhmann (1993) distinguishes between risk and danger, defining risk as a potential loss contingent on a decision and danger as an external threat. Flooding would previously have fitted Luhmann's (1993: 22) definition of danger; 'a possible loss that is considered to have been imposed externally', either from god or from nature. However, the dominant conceptualisation of flooding has now been shifted to the other side of this particular formation and is now constituted as 'risk'.

Beck (1995) notes how even floods are rarely viewed as acts of God or the result of nature gone wrong in the contemporary age but are instead viewed in terms of human intervention<sup>2</sup>. Conceptually then, understanding flooding in terms of risk can be seen as implying a greater level of human accountability and also control (Lupton 1999a). The significance of risk in this respect will be discussed later the aim for now is to detail the emergence of a discourse of risk management and the increasing emphasis on risk calculation in relation to flooding. The focus is thus upon elaborating the discourse of risk with regard to flooding and examining the implicit differentiation between strategies of risk management and risk assessment techniques.

In the case of flooding, the utilisation of risk assessments has a reasonably long history. Certainly, the characterisation of flooding as an assessable risk in insurance

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<sup>2</sup> A distinction is maintained in this thesis between flooding as risk and climate change as risk which in analysing Beck's assertions is not seen to be incongruent with his views. This is for later when questions concerning the emergence of the risk discourse, at a time when flooding comes to be more pervasively conceptualised in association with climate change, are addressed using the conceptual literature. The significance of 'risk' for modern and contemporary societies is highlighted as important in this respect.

terms is not a new phenomenon. The emergence of the flood risk management discourse, however, is comparably new. In addition, the risk management discourse also entails a noted increase in the focus on risk calculation and the availability of data and models for this practice. Some studies give explicit attention to the emergence of a risk management discourse in the UK and these will be taken up now as a point of analytic departure on this subject.

This UK based research shows that a broad range of social issues and problems have come to be understood in the terms of risk. Flooding is apparently no exception to this trend. The work of Power (1999; 2004) is of particular relevance in relation to this growing discourse of risk management as he has mapped this trend across various others domains. He refers to a 'risk management explosion' (2004: 9). Power (2004) offers an explanation for the increasing prevalence of the risk discourse in contemporary society<sup>3</sup>. For Power, risk talk and risk organisation practices relate to a fundamental contradiction in the organisation of political life. On one hand, there is a functional imperative to maintain myths of control and manageability as this is what various interested parties demand. On the other hand, there are consistently occurrences which appear as failures, scandals or disasters and threaten organisations, suggesting a world out of control where failure may be endemic. Power (2004) argues that risk management organises that which cannot be organised, because individuals, corporations and governments have little choice but to do so. He suggests that risk management implies 'a new way of allocating responsibility for decisions which must be made in potentially undecidable situations' (Power 2004: 10).

Power (2004) notes how many agencies, which have traditionally played a role in taking risk on behalf of the public, such as insurance companies, appear now to be handing risks back as part of their own risk management activities. In Power's view the pervasiveness of risk management is characterised by risk strategies that displace valuable professional judgement in favour of defensible process. He notes that risk management is more than the technical calculation of risk; it embodies significant values and ideals. Power suggests that the explosion of the risk industry represents a number of different but convergent pressures for change in organisational practices

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<sup>3</sup> He notes that his study (like this one) is focused on the UK only and may not be applicable beyond this scope (Power 2004).

for dealing with uncertainty. In Power's (2004: 13) term 'the risk management of everything' refers to the suggestion that more events and things are being seen and described in terms of risk, even though the concept itself remains elusive, contested and 'inherently controversial'.

Power asserts that the vagueness of the concept is a necessity for the widespread impact of the notion. For him the important question is not what is risk but how do we know risk? For the analysis in this thesis both of these questions are of implicit interest, however, at this point the focus is on the latter. The aim at present is to identify the *emergence* of the risk discourse in relation to flooding. Detailed examination of the relevance of such a shift conceptually is postponed for chapter eight of the thesis. The assertions to be made herein depart from Power's analyses but are not contradictory, rather the notions to be conveyed here run along a slightly different trajectory to that which Power takes. Aspects of his work with relevance for this thesis will be drawn upon selectively in this chapter.

Adams (1995) has also noted the relevance of risk management discourses for contemporary society. In his treatise on risk he discusses Britain's Royal Society report on risk assessment. In his analysis Adams outlines a clear distinction in the report between the scientific basis for decisions about risk and the policy basis. He explains that a risk management strategy refers to the policy basis of decisions about risk, while the scientific basis refers to the calculated assessment of risks. Adams (1995: 8) highlights the emphasis, in the Royal Society report, on the necessity to retain a clear conceptual distinction between assessment of risks and the consideration of risk management alternatives. This notion that scientific risk assessments can be clearly distinguished from political risk management has been critiqued.

Horlick-Jones (1998: 80) for example, refers to this distinction as 'rather contrived' and asserts that 'the social' is often built into the object of risk. He explains how values and socially contingent decisions are a significant part of the process of risk assessment. He writes 'the identification and assessment of risk is both a human and a social activity and, as such, is concerned with the production of meaning and a shared understanding of reality (ibid.). The separation between risk management and risk

assessment is thus, for Horlick-Jones, merely a device for implying the objective nature of risk assessment - an implication which he views as a fallacy.

The distinction between risk assessment and risk management, although regarded critically here, is a useful differentiation for understanding the emergent risk discourse in relation to flooding. The utilisation of risk methodologies in relation to flooding has a comparatively long history when contrasted with the risk management discourse that has become notably prevalent in recent years. It is asserted that there are undoubtedly value judgements involved in risk assessment, indeed there are certain biases that underpin the assumptions associated with this methodological approach which are discussed later in the thesis. For present purposes, the distinction can assist in understanding the marked shift to the language of risk management and the change in approach to flooding that this is seen to mark, in contrast to the increasing focus of risk calculation and assessment. Before utilising this distinction in analysing the risk discourse in relation to flooding there is a need to critically discuss the notion of 'risk management' in conceptual terms. The work of Adam (1998) is important in this respect.

Adam (1998) designates risk management approaches as inadequate conceptual tools for tackling contemporary socio-environmental issues. Adam takes a critical stance on management approaches specifically in relation to contemporary socio-environmental issues. She posits several assumptions as integral to notions of management. First, she explains, the capacity to manage is dependent on the 'boundedness of that which is to be managed'; i.e. the phenomenon must be delimited in time and space, occur in a known place and have a discernable beginning and end. Secondly, management entails a fundamental 'reliance on the ability to establish causal connections and identify causal chains of events, which require unambiguous relations across time and space' (Adam 1998: 81). Thirdly, and crucially for management, there is a pre-requisite for accessibility to measurement, quantification and control. Finally, in risk management "solutions" are constructed on the basis of a known past and projected into the future' (ibid.). Adam critically deconstructs these assumptions underpinning management, demonstrating the inadequacy of such a conception for contemporary socio-environmental concerns, of which climate change is one.

Adam summarises her assertions with regard to the features of contemporary socio-environmental concerns. On this point she is worth citing at some length;

Whether we are encountering the impact of synthetic chemicals, ozone depletion, air and water pollution, radiation, or a new disease such as BSE, the defining features seem to be spacio-temporal unboundedness, non-proportionality, time-space distanciation, contingency and a high level of indeterminacy. Industrially produced and induced environmental hazards and degradations tend to be characterised by invisibility and periods of latency after which outcomes are no longer traceable with certainty to original sources. Often problems are only recognisable as such after they have been identified through the mediated loop of science and once they have been brought to public attention. (Adam 1998: 81)

Adam thus asserts that socio-environmental conditions are at odds with the assumptions and practices associated with risk management of the environment. She explains that in the terms of risk management, ameliorative action tends to be focused on visible symptoms and 'clock time and linearity tend to exhaust the range of temporal facets' (ibid.). She iterates that in relation to issues such as climate change, causes can not be established on the basis of traditional, material scientific reasoning and evidence. The time lags, latency periods and broken chains of events, associated with such problems, create insurmountable difficulties in determining backward causation. She continues 'the interaction of rational technological systems with open, generative ecological processes creates inescapable indeterminacy' (Adam 1998: 81). Adam explains that in relation to issues characterised by such features 'the future cannot be managed on the basis of past experiences' (ibid.). However, she acknowledges that at the same time, these socio-environmental problems are symptoms of past actions which require responses. The difficulty, in Adam's view, is that risk management seems inappropriately matched as a response to some of the contemporary socio-environmental problems to be faced in the contemporary age.

For Adam when the causal link to the past is broken and the possibility of future events becomes indeterminable, the potential for action in the present seems not to be captured by what is conventionally understood as management. She asserts that the notion of risk management in relation to such issues is a contradiction in terms, since where effects cannot be delimited in space or time it is difficult to establish meaningful targets. In addition, Adam (1998: 82) writes, 'since the effects are not

proportionate to the causes and are not distributed in a uniform way they need to be tackled in an eco-holistic way, which means with reference to both interactive connectivity and specific contexts'. She thus concludes that the possibility of conventional management, risk assessment and control in these instances is an illusion which merely facilitates a 'business as usual' approach.

These assertions with regard to contemporary socio-environmental issues are unpacked in more detail through the thesis. It is worth, however, flagging such contentions here as the parallels begin to be drawn between the nascent understanding of flooding as a climate change impact, and the increasing conceptualisation of flooding in terms of risk. Adam's (1998) assertions are made in reference to contemporary socio-environmental issues like climate change. While flooding as an issue exhibits clear differences from climate change, the intersection of the two issues and the delineation of flooding as a climate change impact, alters the contours of the problem of flooding. The conceptual implications of this intersection are for later.

At this point it is worth noting that the discourse of risk management and the increasing focus on calculation occurs in simultaneity with the demarcation of flooding as a climate change impact. This is interesting given the assertions introduced above regarding the difficulties inherent in approaching issues like climate change in terms of risk management. The task for the next section is to reveal the conception of flooding in terms of risk. The literature which has been referred to above will be drawn upon in the following discussion where relevant for expounding the analysis. The language of risk management and flood risk is utilised at points in this thesis in a descriptive capacity. It must be made clear that this language is not utilised naively; the implications of this framing are in many senses the subject of this thesis.

### **Risk Managing Floods**

At the present time in England and Wales a new and emergent framing of flooding is apparent. In the political sphere, for many years the discourse surrounding the issue of flooding has been one primarily concerned with defending against the natural hazard. As previously outlined, today the problem of flooding has come to be represented as a

symptom of climate change. At the same time, prior strategies for tackling flooding are called in to question; the dual concerns, relating to hard flood defences and land use, combine to create a challenging context within which flooding must be handled. The response to this framing appears to represent a move away from an understanding and discourse of defence to one of risk management. There is a clear displacement of the term 'flood defence' in favour of 'flood risk management'. Exactly, what this discursive change means will be expounded through the following discussion. It is posited that the understanding of flooding, demarcated in the previous chapter, is implicated in this change in the discourse. As a point for departure the discursive shift to 'risk' will be delineated.

### *Talking Risk*

The distinction drawn above utilising Adams' (1995) analysis between risk management and risk assessment is taken up for the capacity it provides in explaining the recent emergence of the risk management discourse in contrast to the longer historical trajectory associated with risk assessing flooding. In concurrence with Horlick-Jones' (1998) critiques of such a differentiation however, the distinction is not understood to imply any notion of objectivity in relation to scientific risk assessment practices, in contrast to political risk management activities. Instead it is implicitly held that risk assessment practices also involve value judgements<sup>4</sup> (some of which are examined in later sections) and that there is a strong interconnection between the practice of risk calculation and notion of risk management. The interactive nature of such conceptions for tackling social issues will be revealed in this chapter, as the increasing emphasis upon risk calculation is expounded as integral to the emergent risk management approach.

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<sup>4</sup> It should be noted that actors interviewed and observed for this study were well aware and accepting of contextual value judgements involved in risk assessment activities. Horlick-Jones (2005) notes this situated way of seeing in relation to risk calculation in his critique of the assumed rational actor paradigm or canonical rationality that the *concept* of risk is seen to imply. Horlick-Jones (2005: 258) asserts that risk rationality is a situated practical rationality that is inherently plural but not 'anything goes relativism'. Risk rationality is held to entail emergent logics that arise in specific interactional contexts and reflect a matrix of concrete concerns. These assertions are not examined explicitly in relation to the data here but can be seen as implicitly assumed in this discussion of risk.

Flood risk management can only be described as a rather vague concept. This is perhaps a consequence of, what Horlick-Jones (1998) has described, as the contrived origins of the term. However, an attempt at clarification in this specific case is deemed important for the discussion. Several participants in the study referred to the characterisation of flooding as risk. In the extracts below it is possible to see the identification of an emergent narrative of 'flood risk' and the notion of 'reducing risk'. The language through which tackling the issue of flooding was previously expressed is described as 'flood defence'. The increasing prevalence of the risk discourse is evident in the literal replacement of the word 'defence' with the term 'risk management'. Participants in the study vocalised this change in overt ways during the interviews. This marked change in language is also clearly present in the document data and was apparent in those conversations that formed part of the observation - although the observation work has already been noted as providing a contextual backdrop for the analysis and will not be explicitly examined here. In the extract below an interviewee classified as an academic in this analysis verbalises this change in the language utilised to characterise flooding.

Flood defences or reducing the flood risk - flood defences are not the word to use anymore - reducing the flood risk for that type of scenario. (Acad. Participant 7)

Here the participant makes an explicit point regarding the 'word' to be used in discussing flooding. They switch from utilising 'flood defences' to 'reducing the flood risk'. This overt change in the language, as noted, occurs together with the emergent understanding of flooding mapped in the previous chapter. Links between these shifts in representation are thus posited. The discourse of risk management is seen to emerge as a policy solution to flooding understood in the contemporary context. The participant cited below highlights a similar shift in the language utilised to discuss flooding. In contrast to the interviewee above this interlocutor is classified as a policy-political actor.

We have responsibility for water management...so flood defence... now we've moved from flood defence to flood risk management. (Pol. Participant 16)



The extract above is indicative of the change in the language utilised to discuss flooding. Both of these participants characterise the terminology of risk as an emergent discourse for describing practices associated with tackling flooding. The nascent dialogue of risk is discussed by some participants as entailing more than a change in descriptive terms. There are implied shifts in approach in this linguistic turn. The interviewee cited below explains this shift in terminology and the meaning it holds in terms of a changing approach.

I think it has evolved from an engineering approach to a portfolio approach. The engineering approach probably existed until the early 1990's. There's been a process of change since then from flood defence to flood risk management. There were elements of it always there but its somehow gained more professional acceptance in more recent years. (Acad. Participant 11)

For this participant the shift to 'risk management' is highlighted as marking a gradual alteration in approaches to tackling flooding. This different terminology through which flooding and the efforts to tackle the issue are described, is evident throughout the discourse and was utilised by social actors with differing roles across varying organisations. The emergence of the risk management discourse does mark a change in the policy approach. This is explicitly detailed in the Government's first response to the consultation on flooding, published in 2005. In this strategy, defending against flooding is supplanted by the notion of managing risk.<sup>5</sup> This new policy gives an indication of the implied meaning of the emergent discourse of risk.

The 2005 strategy is entitled *Making Space for Water: Taking forward a new Government Strategy for Flood and Coastal Erosion Risk Management in England* (DEFRA 2005). The use of the terminology of risk management in the title of the recent policy is indicative of the marked prevalence of the language of risk throughout the document. The discussion of the issues in terms of risk is integral to the new document. Indeed, there is a section in the new policy dedicated to 'risk issues' (Defra

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<sup>5</sup> It is worth noting that the change in language, although representative of the political desire to suggest their aim to advocate strategies that entail 'working *with* natural processes' (DEFRA 2005: 15), is not a particularly dramatic change - linguistically speaking. The many different meanings and uses of the word 'manage' imply a less significant change. For example, manage can mean the ability to control, as well as meaning 'to cope with a difficult situation or to survive despite difficulties' - which it is perhaps being used in the policy to convey. The contradictions which Power (2004) notes in the shift to risk management between the functional imperative to maintain the myth of control and the occurrences of failures implying a world out of control, are of interest here.

2005: 19). This chapter of the strategy details the improvement of the 'reliability of risk information' (ibid.). It is stated that the 'improvement in the risk evidence base will drive our risk management activities' (ibid.). Here an evident link is made between risk evidence, derived from risk methodologies, and the practice of risk management. The emphasis on improving and applying risk calculations is regarded as integral to the new risk management approach.

There is further evidence of this increasing emphasis upon risk assessment as part of the risk management approach in the interview data. In some senses, risk management in relation to this issue is held to refer to a shift to a nationally organised system for the distribution of funds based on scientific risk assessments. In this sense the notion of risk management has clear parallels with Adams' (1995) clarification, in that it denotes a system for political decision-making with regard to flood risk. It is also clear, that risk management strategies are termed such because of the emphasis on knowledge derived from risk calculations to inform these decisions. Below a participant from the insurance sector explains this shift in practice.

They are moving towards prioritising which schemes should be funded on a national basis rather than locally and regionally so that UKPLC get the best return. Because historically, it was almost like, you had spent quite a lot on flood defence and that meant you got more funding, so you could continue to do more. Whereas if in the past you had not had bad problems with flooding or not been particularly focused on that as an issue – you maybe had other priorities and hadn't spent much - therefore you weren't being given much to spend but you might have had far more that you needed to do and needed to do urgently. Progress has been made in terms of having an objective appraisal process, which looks at flood risk and includes not just the probability of flooding but the consequences. (Ins. Participant 9)

Here, the participant explains an important element of the recent shift (described in terms of flood risk management in the discourse) was the move to 'objective appraisal' achieved through the application of flood risk calculations.<sup>6</sup> This involved a

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<sup>6</sup> In Douglas's (1985; 1992) terms this participants understanding of risk would constitute a 'hierarchist's' approach. The prevalence of such an understanding of risk is evident throughout the data. This is regarded critically as it ignores the essentially value laden nature of risk however, the illusion of objectivity is also regarded as integral here to the capacity of the tool to provide decision-makers with a means or coping with uncertainties. Those utilising risk calculation appear to view the tool as imperfect and acknowledge the situated nature of such decisions. The knowledge derived from such an approach is still regarded as more objective as a decision-making base. This differentiation, however, is left implicit.

change in the basis for funding allocation with regard to flooding and the national application of risk assessments as a base for decisions. Funding comes to be allocated on a national basis, utilising scientific risk assessments, to determine the necessity for flood defences in any given area. Sites and areas at risk of floods are compared nationally to determine which areas are most in need of flood defences.<sup>7</sup> Flood risk management therefore, in some senses refers to this shift to a nationally applied risk assessment decision base<sup>8</sup>. The participant cited above was also asked if they thought this change in decision-making procedures was in part due to the shift to understanding flooding as a long-term problem in light of climate change, they responded saying 'yes absolutely' (Ins. Participant 9). This is indicative of the influence of the climate change framing in the emergence of the risk management approach.

An increasing emphasis on risk calculation is asserted as being part of the new risk management approach. The relatively recent creation of flood risk maps, designating flood risks across the country, is seen as a further indication of this. In the quote below, the 'increasing demand' for nationwide flood frequency estimates is noted in relation to the flood risk maps. In this quote, reference is also made to the Flood Estimation Handbook (FEH), which provides guidance on flood risk calculation in relation to flooding.

The Flood Estimation Handbook (FEH) is a new publication from CEH Wallingford, giving guidance on rainfall and river flood frequency estimation in the UK. Flood frequency estimates are required for the planning and assessment of flood defences, and the design of other structures such as bridges, culverts, and reservoir spillways. *There is an increasing demand for estimates that can form the base for flood risk maps, important in the planning of new developments.* (CEH Wallingford website 2006) (*My emphasis*)

The Flood Estimation Handbook has been described as 'the principle procedure for estimating flood risk in the UK' (Morris 2003: i). The FEH was created in 1999 to replace the prior Flood Studies Report [FSR] and entails 'a restatement of the FSR

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<sup>7</sup> In addition to this cost-benefit analysis is important in the decision-making process. A high probability of flooding does not necessarily mean flood defences will be allocated. The cost of defending any given area must be economically viable, thus the cost of losses are important in the final decisions (see chapter seven for a more detailed discussion of these processes).

<sup>8</sup> This is in relation to the government flood defence allocation scheme. Private companies/developers are also required through planning guidance to provide flood defences in some instances.

rainfall-runoff method and a new statistical method' for estimating flood risk (Morris 2003: 1). This replacement of the FSR with the FEH, and the creation of the new statistical method that it entailed, can also be seen as indicative of the increasing emphasis placed on risk and improving risk calculation with regard to flooding. The formulation of flooding as a risk problem appears to result in a focus upon gathering data and developing better risk assessments in order to inform decisions regarding flood risk management. This focus on improving risk calculation was evident in other forms of data. The extract below, from a participant described as a policy actor, is indicative of the growing emphasis on determining risk.

The risk mapping needs work, what we have at the moment is not the purest map it's a property map, but in future a lot of work in science is being done on consequences, so we're attempting to look at not just the properties but also the consequences of those properties getting flooded, so lots of things are going on in the research side and the process side which will take the research forward. (Pol. Participant 16)

This participant explains how 'a lot of work' in relation to calculating risk with regard to flooding is being done. The shift to flood risk management thus entails an increasing emphasis upon calculation of risk in relation to flooding. In this sense flood risk management implicates risk calculation. Johnson et al (2004: 31) in their study of flood crises as catalysts for policy changes also note how the recent increase in floods spurred a 'move away from the traditional focus on defending against floods to a focus on managing the flood risks in terms of both probabilities and consequences'. They thus also indicate a perceived link between a greater emphasis on risk assessment calculations in decision-making and the risk management approach. The floods of recent years are also asserted as a factor in spurring this political change to flood risk management and the greater focus on calculation that this implies.

In addition to the greater focus on risk calculation, there are also shifts in policies for tackling flooding which are subsumed under the heading 'flood risk management'. These approaches to dealing with floods will be the focus now in unravelling the meaning of the discursive move to risk management. Risk management is the terminology used to describe the shift in policy strategy. This has repeatedly been identified in the data as the introduction of a 'portfolio response' to flood risk, which entails a heightened emphasis on 'living with floods'. The dominant understanding of flooding as contemporary problem detailed in the previous chapter has a clear

influence in this new approach. The shift towards notions of living with floods arises as a response to the difficulties engendered by the contemporary understanding i.e. hard flood defence are understood as no longer adequate, while development pressures remain and floods are expected to worsen with climate change.

The change in approach, implied by the new discourse of risk management, entails several new strategies described in *Making Space for Water*. The following headings are utilised in describing the new approach: 'risk issues', 'land use planning' 'resilience and resistance', 'rural land use, land management and managed realignment', 'integrated urban drainage management', 'living with the changing coast' and 'living with flood risk' (DEFRA 2005). The titles are indicative of what these policies entail. These strategies can be contrasted with the priorities in the previous policy document the *Strategy for Flood and Coastal Defence in England and Wales* published in 1993 (MAFF and WO 1993).

In the 1993 strategy the priorities are listed as 'flood warning systems; urban coastal defence; urban flood defence; rural coastal defence and existing rural flood defence and drainage schemes; and new rural coastal defence and drainage schemes' (Maff and WO 1993: ii). Here, there remains a strong focus on defence. There is some similarity with the policies in the 2005 strategy, e.g. the recognition of flood warning systems as significant. However, the warning systems in place in 1998 were found to be inadequate and have since been renewed. This is indicative of a more heightened focus on strategies of flood warning in recent times. The marked change in approach from one described in terms of defence to one delineated in the language of risk management is evident. Moreover, the strategies themselves are indicative of an approach where notions of defence give way to concepts of living with floods.

To expand on the new strategies, 'resilience and resistance' refers to the notion of building properties that are resistant or resilient to flood damage. This approach to flooding would involve existing properties in flood areas being adapted to incorporate resilience and resistance. In addition, new building in flood areas would be designed to be resistant to flooding. There are policies focused broadly around land use. The

introduction of Planning Policy Guidance Note (PPG) 25<sup>9</sup> to ensure flood risk is taken into account in planning is important to the land use planning policy. PPG 25, which is in place to ensure that flood risk is taken into account in planning, is 'allied to effective flood resilience and mitigation measures where development does go ahead in flood risk areas' (DEFRA 2005: 21)<sup>10</sup>. The rural land use and land management policies focus on using rural land to create wetlands, widen river corridors, restore rivers and so forth. This approach essentially involves restoring or perhaps artificially creating 'natural flood defences'. These approaches are designed to work more closely with natural processes rather than against them.

The urban drainage policies are directed at improving drainage in high risk urban areas. There are several facets to this particular aspect of the policy including: a catchment wide approach to urban drainage and enabling different authorities to work together. The remaining policies centre on improving flood warning systems, education and clarifying responsibilities, with the aim of enabling people to live with flood risk (DEFRA 2005). The policies advocated in *Making Space for Water* thus entail an emphasis on building abilities for individuals to live with flooding, and on utilising soft engineering approaches to create space for water in the environment. These policies clearly involve a less controlling approach to nature and can be seen as a response to the contemporary framing of the problem.

In the strategy, plans are outlined regarding the aim to encourage 'the use of softer solutions including realignment of defences and multi-functional wash lands where appropriate' (DEFRA 2005: 17). In the previous 1993 strategy there was also recognition of knowledge relating to the problems associated with hard flood defences, however, there was a clear focus on the integral role that they would continue to play. The 2005 strategy by contrast, places greater emphasis on the changes to be implemented in terms of addressing the problems with hard flood defences. This extract taken from *Making Space for Water* (2005: 15) refers to the 'vision... [of] the future as a result of this strategy'.

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<sup>9</sup> Policy Planning Statement (CLG 2006) replaced and strengthened PPG 25 in 2006. This statement reinforces the risk-based approach to decision-making.

<sup>10</sup> The implementation and effectiveness of such approaches in tackling flooding is discussed in chapters six and seven.

The results of the strategy will be seen on the ground in the form of more flood and coastal erosion solutions working with natural processes. This will be achieved through making more space for water in the environment through, for example, appropriate use of realignment to widen river corridors and areas of inter-tidal habitat and of multifunctional wetlands that provide wildlife and recreational resource and reduce coastal squeeze on habitats like saltmarsh. (DEFRA 2005: 15)

The results of the risk management strategy 'on the ground' are described as entailing a greater focus on solutions that work with natural processes. As noted above, this is positioned in the thesis as a response to the context in which the problem has come to be understood. The strategies proposed under the banner of flood risk management are approaches which entail a distinct shift in practices away from defending against floods. The emergent discourse of risk management is thus characterised by 'management options' designed to improve capacities to cope with increased levels of flooding. In this respect, the notion underpinning the new policy is that flooding is endemic to the contemporary way of life. The extract from the interview with the participant cited below, is indicative of this notion implied in the risk management discourse.

Once the inevitable happens and they do flood because as we all know now and we haven't written on our tongues you can't stop flooding you can only manage it. (Cons. Participant 1)

This participant suggests that the notion of management, in this context, implies the inevitability of flooding. They also suggest that this is a recent shift through their expression 'as we all know *now*'. Further, their comment is indicative of the force with which the contemporary notion of risk management is positioned in opposition to one of defence and protecting from floods. They state 'we all have it written on our tongues' implying the consistency and fervour with which this shift in approach to flooding is advocated. Floods are thus no longer a problem to be averted but a risk to be managed.

The shift in policy approach - as with the emergence of the contemporary framing - is depicted as related to the 1998 and 2000 floods<sup>11</sup>, which in Power's (2004) terms

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<sup>11</sup> This assertion is supported by previous research conducted by Johnson et al (2004). They identify the clear impact of the 1998 and 2000 flooding events close together in accelerating the emergence of a particular understanding of floods and a specific policy approach of flood risk management.

could be described as failures indicating the impossibility of control. The invocation of a discourse of risk management can thus - in line with Power's assertions - be viewed as an attempt to retain the illusion of control apparently demanded by publics. In contradistinction, the new strategies also imply a relinquishing of control as defence is removed from the discourse and policies of living with flood risk invoked. Risk management can be seen in this context as a means of retaining notions of institutional control in a situation which is characterised by the necessity to acknowledge a lack thereof with regard to actual occurrences of flood. It entails a way of rationalising and coping with events of flood; the notion that risks cannot be averted but can only be managed allows floods to be explained away as anticipated and expected occurrences. By invoking the notion of risk floods are transformed into events that are merely the unfortunate outcomes of previously decided levels of acceptable risk.

The underlying implication of risk rationality is that an important opportunity has been created through the taking of risk e.g. the opportunity of having more houses in an already highly populated area is achieved through taking the risk of building on flood plains. The outcomes, in this case floods, are thus simply an unfortunate but necessary part of the risk taking apparently necessary to secure the opportunities associated with the modern way of life. This risk rationality is seen here as a means of rationalising social problems which lay beyond the control of society's institutions making them appear as mere side effects of rational optimal decisions. This kind of rationality allows these problems which are in actuality beyond control to continue; it does not represent a solution but rather a coping strategy and a means of maintaining what is, rather than innovating changes. These assertions will be returned to later in the thesis for now the emergence of the risk discourse and the implied meaning of such a shift for policy remain the focus.

In an extract communicated on the Country Land and Business Association [CLA] website, the implication of the change to a discourse of flood risk management is noted. They write;



Already DEFRA has moved from planning flood 'defence' to talking about 'flood risk management' – a minor point but one which reveals its underlying approach. (CLA 2006)

In the remainder of the text cited above, the Country Land and Business Association express concern regarding the 'underlying approach' suggesting that it implies the notion of abandoning some areas, rather than constructing or renewing defences. They take a critical stance with regard to such an approach asserting that 'the alternative to hard defences is not abandonment' (CLA 2006). The notion of 'living with flood risk' is thus characterised by the Country Land and Business Association in terms of the abandonment of land. There is a significant likelihood of abandonment for some areas where it is deemed no longer economic to maintain defences. In a document published on the DEFRA website it is stated:

...it remains the case that resources will never be sufficient to defend all properties everywhere. Keeping the sea at bay and maintaining river banks and walls is a never ending and expensive process... this means making hard choices about where we can and cannot continue to maintain defences. (DEFRA 2006d: 1)

The nascent terminology of risk management in this sense can be seen as relating to economic decisions, taken in light of the increases in floods experienced in recent years and the anticipation of more flooding in the future. This is a marked change in recent years, as previously flood defences countrywide were managed and maintained by the Environment Agency. In the document cited above DEFRA explain 'the environment agency, which is responsible for sea defences, has no tradition and little experience of discontinuing the maintenance of defences' (DEFRA 2006d: 2). This extract is indicative of the shift in approach implicated in this move to abandon defences. The move to risk management can thus on one level be seen as relating to this change in approach.

Thus far the greater focus on risk assessment to prioritise allocation of funding for flood defences on a national basis has been asserted as a significant part of the shift to management. The greater focus on risk calculation in this risk management approach has therefore been asserted. The new strategies for tackling flooding implied in the risk management discourse have been outlined. These entail an emphasis on living with floods, involving a focus on warning systems, education and building in

resilience for example. Together these underlying facets of the risk management approach imply that risk (including probability and consequences) will be calculated at a national level and then funds will be allocated to be spent on the strategies described in the new policy. The strategy appears to imply that where funds are allocated they will be spent on efforts to make housing in flood risk areas more resilient, or to realign rivers to re-create natural flood defences. This, however, is not quite the case.

It is apparent that in many cases implementation of the new approaches will not be attempted and attention, albeit briefly, is drawn to this in the 2005 policy 'in built up areas the limited space may limit the scope for innovative solutions' (Department for Environment, Food and Rural Affairs [DEFRA] 2005: 21). The following two chapters examine the efforts to shift away from a reliance on strategies of defence and the barriers to such innovations. In addition, the difficulties that the risk approach presents for exacting changes are examined with reference to both the data and conceptual works.

### **Managing Flooding in the Contemporary Context**

It is proposed that it is no coincidence that as flooding comes to be conceived in terms of climate change, strategies of risk management are invoked and an increasing focus on risk calculation develops. The uncertainties associated with climate change are seen as important in the shift to a risk approach with regard to flooding. At present, it is noted that strategies of risk management have been critically assessed as inappropriate in the context of contemporary socio-environmental risks such as climate change (Adam 1998). At the start of this chapter, Adam's (1998) assertions regarding the inappropriate nature of these conceptual tools for dealing with issues such as climate change were mapped. Adam proposed that risk calculation and notions of management were ill fitting for tackling problems characterised by indeterminacy, latency periods and where the causal chain is broken. It is thus interesting that the risk approach becomes more pervasive as flooding comes to be understood as a climate change impact.

Flooding and climate change are analysed in this thesis as distinct issues with differing temporal and spatial characteristics. The distinction between them is apparent in terms of how knowledge(s) of these two concerns are achieved i.e. for knowledge of climate change there is a reliance on social institutions (i.e. scientific and political) to produce it and in turn give the issue a reality. Flooding, however, is not characterised by the kind of invisibility associated climate change. People can thus know flooding in different ways, through their own experiences of it. The creation of flooding as a climate change impact however, introduces new complexities with regard to knowing about flooding. The notion is introduced here that in conceptual terms risk calculation and risk management strategies become less suitable for understanding and coping with flooding when understood as a climate change impact. It is thus of significant interest why risk strategies become increasingly pervasive in the contemporary context where flooding as issue appears increasingly difficult to encapsulate in such terms.

These questions are a central focus of this thesis; indeed it is around such questions that this treatise has taken form. The differences with regard to how flooding and climate change are interpreted through contemporary knowledge bases, as well as the intersection between these two issues are examined in detail in chapter eight. For now, however, it is worth noting that Power's (2004) explanation for the growing prevalence of 'risk talk' is not contradicted here. However, it does not quite provide the capacity to explain the increasing emphasis upon risk strategies in relation to these particular issues. His assertions go some way in indicating the implications of risk but his explanatory focus is upon what he sees as an individualisation process. He thus explains that,

While the risk management of everything may be fad, a more complete explanation appeals to an individualisation process which drives risk experts and professionals to focus more on their personal, legal and reputational risks, rather than on the primary risk embodied in their formal mission. (Power 2004: 16)

These notions with regard to risk management are in many senses supported through the research here. However, Power's assertions relate more to the observed nature of the current features of risk in the contemporary age, rather than to an explanation for its emergence. In contrast, in this analysis the contemporary prevalence of risk

discourses and practices are seen as related to the way flooding is defined and understood in the contemporary age. Risk talk and practices are seen to emerge as a solution to the problem understood in the contemporary context.

Power's (2004: 8) explanation for the 'risk management of everything' is not, as noted, contradicted in this thesis but it does not provide the explanatory capacity for understanding the observed emergence of a discourse of risk in relation to flooding along side the conceptualisation of flooding as a climate change impact. The more conceptual sociological risk literature has provided insights in this respect and is examined for its capacity in understanding these trends in the final chapter of this thesis. The works of Beck (1992a), Luhmann (1993) and Adam and Groves (2007) have been particularly useful in informing thought in this sense. Before proceeding to this analysis, however, it is important to better understand the difficulties in tackling flooding in the contemporary context.

The next two chapters of the thesis examine the issues in addressing flooding highlighted in the empirical data. These are discussed along with assertions in the conceptual literature relating to the empirical analyses. The solutions presented in the policy strategy are thus analysed in relation to the wider empirical data and the conceptual literature. This analysis provides insight into the difficulties in tackling flooding as it is now understood and makes more pertinent questions relating to risk as a solution. The data reveals a complex picture in which social actors struggle to innovate and implement solutions in a situation characterised by competing agendas, contradictions and paradoxes.

### **Concluding Remarks**

In this chapter, the contemporary policy has been analysed along side the interview data to reveal the emergence of a risk discourse in relation to flooding. It has been suggested that a risk management approach to flooding has become prevalent in recent years. The meaning of this for approaches to tackling flooding was an important source of interest in the chapter. The reason for the emergence of the risk management discourse was also important. It is noted that this discourse of risk emerges as flooding comes to be understood in the context delineated in the previous

chapter. The understanding of flooding as a climate change impact, coupled with the difficulties engendered by flood defences and high levels of development in flood plains, is seen as implicated in this shift to characterise solutions to flooding in terms of risk management.

This discursive shift has been given meaning through the examination of the shifts in approaches to flooding. The language of 'flood risk management' has been highlighted as implying the application of a nationalised system of risk assessment, as well as indicating the emergence of different proposals for tackling flooding. The contemporary policy solutions are characterised by an emphasis on living with floods and shifting away from past practices now associated with escalating flooding i.e. hard flood defence and development of flood plains. The language of flood risk management is thus depicted as in part describing this transition in approach.

A difference was noted between epistemic bases involving calculus of risk and narratives of risk management. However, the risk management approach was seen to entail a more significant focus upon calculations of flood risk. As such there was a noted connection between the risk management discourse and risk assessment. Decisions about solutions to flooding will be more heavily informed by risk calculations and as such, improvement of risk evidence becomes an important aim with regard to tackling flooding.

With reference to the work of Adam (1998), the notion has been introduced that risk management is an inappropriate conceptual tool for comprehending and deriving solutions in relation to hazards such as climate change. The latency periods between cause and effects, invisibility and the spatially and temporally unbounded nature of such issues, make notions of management inappropriate in conceptual terms. These assertions will be examined in greater depth later in the thesis. For now questions have been introduced regarding the emergence of the risk management approach and the increasing emphasis on risk with regard to flooding as the issue also comes to be understood as a climate change impact.

In summation, the empirical analysis reveals a discourse of risk management involving an increasing focus on risk calculation and the attainment of better data and

more complex modelling. The conceptual analysis indicates difficulties in the use of 'risk management' for understanding complex issues such as climate change. When viewed together the empirical and the conceptual provide insights which lead to important questions regarding the emergence of a risk management discourse in relation to flooding. These relate to questions regarding why risk becomes increasingly important as a means of understanding and providing solutions to flooding in the contemporary context of climate change. Power's (2004) assertions provide hints relating to the control implied in notions of risk. However, the conceptual analyses of Beck (1992a), Luhmann (1993) and Adam and Groves (2007) provide explanatory potential for the emergence of the risk discourse in the seemingly contradictory circumstances that Power (2004) points to. This discussion is the subject of chapter eight.

Before this can be addressed, the difficulties in implementing the changes implied by the risk management discourse are analysed utilising the conceptual literature and empirical data together. Despite the emergent risk management discourse and risk calculation focus, advocated in the policy as a new approach to flooding for contemporary England and Wales, there remain difficulties prevalent in tackling the issues. The risk discourse as a way forward and the apparent barriers to implementing the proposed policy solutions (detailed under the heading of risk management) are the subject of the next two chapters. Through the empirical analysis in chapter six hindrances to change in approach are revealed, and through the conceptual analysis in chapter seven assumptions embedded in risk rationality itself are revealed as exacerbating difficulties in change. Together these analyses bring into question the capacities that a risk discourse actually provides as a solution to the problem understood in the contemporary context. The following two chapters build on the analysis in this chapter to make pertinent questions relating to why a discourse of risk has emerged.



## Chapter Six

### Barriers to Change: Making Space for Water?

We each encounter the inescapability of economic needs, litigious needs, social needs, and spiritual needs. In expressing these diverse requirements – whether individually or collectively – we often convey self contradictory environmental views as well as views that conflict with our environmental actions. (Lowenthal 2000: 252)

#### Introduction

In chapter four, the contemporary conception of flooding as a socio-environmental problem was mapped with reference to the data. The analysis was organised around three key areas through which it is proposed the issue is given form as a contemporary social concern. These relate to the difficulties raised by hard flood defences as a solution in a highly (and increasingly) developed society i.e. they operate by forcing waters elsewhere to areas which are also likely to be developed. The historical legacy of building on flood plains and continuing drive for development has also been noted as a concern. In addition, farming practices and the difficulties associated with sewerage and drainage capacities are highlighted as playing a role in escalating flooding<sup>1</sup>. Finally, knowledge of climate change is posited as significant in the conception of flooding as a contemporary issue. These threads of understanding drawn together create a difficult picture with regard to flooding.

The discourses discussed in chapter five indicate a prevalent view that it is no longer viable to ‘hold the line’ in relation to flooding (Ledoux et al 2004). Under the banner of risk management, policies for flooding are advocated which involve changes in

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<sup>1</sup> These issues with the drainage and sewerage systems as well as farming practices are viewed as significant practices associated with escalation of flooding contemporary England and Wales. They are regarded here as relating to development and land use practices and as such are (implicitly) incorporated in the earlier mapping of the three primary aspects around which the contemporary conception is mapped (i.e. climate change, development and land use, and hard flood defences).

approach to align practices with the current understanding. It is asserted, however, that the shifts in approach that this contemporary framing demands are thus far limited in implementation. The advances in ways of tackling flooding more suitable to the contemporary understanding appear to be stunted. In addition practices, such as development of areas understood to be flood plains continue. This chapter focuses on the narrative extracts through which concerns regarding these issues with implementation were expressed by participants in the study.

It is proposed first, that the implementation of changes in practices with regard to flooding has thus far been limited. And secondly, that there are evident difficulties in making the changes to tackle the issue in the contemporary context. Extracts of data are drawn on in which participants express the view that the present 'actions' with regard to flooding are not congruent with the framing of the problem. 'Actions' here is used in the vernacular sense of the term to refer to what people are actually doing e.g. building flood walls or soft flood defences, constructing houses in certain areas and so forth. The data reveals obstacles and tensions which give rise to the apparent stagnation with regard to the adoption of approaches more appropriate to the contemporary understanding of the issue. It is suggested that the discourse of risk management, discussed in the previous chapter, does not provide a solution to the complex issues which arise in tackling flooding when understood in the contemporary context.

### **Defending the Legacy and Developing the Future**

This first section of the chapter examines the utilisation of hard flood defences and development practices in relation to managing flooding. A continuing reliance on hard flood defences was noted by participants in the study. This is despite the difficulties associated with utilising such means of tackling floods in light of contemporary knowledge(s). It has been asserted that the prospect of sea level rise due to climate change, as well as the effects expected in regard to river flooding with the predicted increases in precipitation, makes defending against floods a less feasible option for the long-term future. 'Holding the line' has come to be regarded as socially, economically and environmentally unsustainable for many areas.



Moreover, it appears as a difficult approach to maintain even in situations where it is economically viable to do so, as notions of building 'higher walls' become problematised in light of the increasing water levels expected due to climate change. The participants in this study, however, indicate a continuing reliance on defensive strategies in relation to flooding. It is proposed that there are significant difficulties in making shifts to depart from this approach to dealing with flooding. At the same time it appears that development in flood risk areas continues. Development is important economically and in order to meet the demands of a rising population<sup>2</sup>. In addition, the concentration of employment opportunities in particular areas, and the difficulties associated with allocating land for building, arises as significant. The continuing practice of defending against floods is the first point of discussion.

The participant below, defined as a policy-political actor, outlines their views regarding the current approach to flooding.<sup>3</sup> They explain that the dominant approach continues to be one of building hard flood defences or 'holding the line' - which has been identified as no longer a feasible option in light of present knowledge and understanding.

Interviewer: What in your view is the dominant approach currently being adopted towards flooding?

Participant: I think its generally building flood defences...

Interviewer: What kinds of defences, is it primarily hard defences or...?

Participant: Yes

(Pol. Participant 4)

Here, the interviewee indicates that the dominant approach involves a continuation of previous strategies of control, with hard flood defences prevailing as the overriding method for tackling flooding. The participant offers no indication as to their normative position on this matter i.e. whether they think this *should* be that case or not. However, it is evident from this narrative that despite the nascent understanding of flooding as a problem, for which past and present practices are no longer appropriate, the implementation of these shifts in practice are as yet limited. This extract provides an example of the kinds of narratives whereby the continuation of

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<sup>2</sup> Gordon Brown has recently put in place revised housing targets for three million new dwellings to be built by 2020 (Planning Portal 2007).

<sup>3</sup>Views discussed here are as they were at the end of 2005 when these interviews were conducted.

hard flood defences as the primary approach to tackling flooding was highlighted. The participant below delivers a similar description of the principal approach to flooding at present. This interviewee is also classified as a policy-political actor for the purposes of this thesis. They refer to the continuation of building defences as the major strategy for flood management.

I think the one that is aiming to protect the most property, if you like, is the capital programme. So the programme of works nationally, that is building or replacing existing flood defences, so that is in real terms the only thing that makes a difference. If you've got 20 houses that flood apart from knocking them down and moving them out of the flood plain the only way you can protect them is to build defences around them and that's the only way, at the moment anyway, that you could stop those 20 properties flooding. So you can do other things like, you know, improve the resilience and flood resistance of them but the chances are there would still be an amount of damage in taking that approach. A lot of time and effort is spent on flood warning but just imagine this mythical 20 twenty properties and you tell them in two hours time they're going to flood, if none of them do anything about that then all the damages will still be the same... I think the predominant approach at the moment is the continuation of building defences. (Pol. Participant 13)

It is possible to see that despite contemporary knowledge(s) informing policy and influencing rhetoric, there appears to be a gap between the changes that the knowledge appears to demand and application in practices. This participant highlights the difficulties with other approaches to flood management, such as warning systems or building in resilience, as less effective in that they do not prevent flooding from happening and thus may not reduce damages to the same degree. This participant suggests that building defences continues to be the dominant approach and, unlike the previous participant, also notes the importance of flood defences in protecting properties.

The knowledge of the necessity for a change in approaches to flooding has been acknowledged in policy at least since the early 1990's as indicated through the analysis of the 1993 policy. The implementation of this shift, to an approach which entails an understanding of the problems associated with manipulating and controlling water, has however not been significant. This raises questions about the extent to which the policies developed in the 2005 first response to the consultation *Making Space for Water* will come to fruition.

The extracts above have been delivered as examples of the indications in the data that hard flood defences continue to be the dominant approach. In the second extract questions are posed regarding the extent to which other approaches can be considered effective in achieving the aims of flood management. The participant expresses the view that 'the only way you can protect [houses] is to build defences around them', asserting that this is the only way to stop properties from flooding. This assertion raises questions regarding the dilemmas which arise in attempting to tackle flooding in the contemporary context. Maintaining hard defences is increasingly regarded as unsustainable; however, this is an important method for protecting people and properties from flooding. The capacities to act for a long-term future in this respect appear to be limited by historical trends in development. Several participants have noted the necessity for continuing the practice of defending against floods. The extract below provides an example of such narratives.

You've got to accept that London is already where it is and that we can't relocate it. We can't afford for the finance market and activities like that to be affected such that, that trade goes elsewhere and we would lose a very important part of our invisible export market... so it's crucial to the country that we actually maintain some of those areas. (Eng Participant 17)

This point has been made by several participants in relation to various developments throughout England and Wales that are located in flood plains. A contradiction becomes apparent between the need to address flooding in the new context and the necessity that remains to protect what is already present. The challenge of implementing change is exacerbated by the need to maintain existing conditions. In the extract above, the participant depicts the necessity to protect London as relating to trade and economic issues. This participant's view is indicative of a difficulty regarding the role of economic pressures in necessitating the maintenance of hard flood defences. This can be seen as an existing tension between the necessity to make changes that are important for the long-term future and the emphasis on maintaining the present quality of life in capitalist societies.

The participant cited below is defined as a policy-political actor. They explain how past ways of developing limit the capacities for change in the present. They note the

difficulties in attempting to tackle flooding in the context of a highly advanced society which has developed in ways that are now denoted as problematic with regard to flooding.

It is really trying to work around what's already there. If you were starting again with a clean sheet of paper, you wouldn't have any of the things that we've got in place, but that's all part of your history. Things develop the way that they do because of changing times and if you had the chance to start all over again we'd probably do things differently but making sure that we do things differently today because we've got all this knowledge now that we ought to be able to make changes and do things differently which we are able to but it's just making sure that we don't end up with the same problems in years to come but it is very restrictive in what we've... in the way that towns and cities are built up. Especially the London's and the like, you know, river side cities', massive encroachment on the whole of the flood plain, no space at all for any sort of mistake, so the only way to defend that is to keep building up at the waters edge sort of thing. Not probably that sustainable if you think about climate change and what might happen not necessarily in the next 50 years but 200 or 300 years and you can imagine you'd never see the river again there'd just be these huge corridors of walls down the side of it. I don't know what the answer is to that one. (Pol. Participant 13)

This narrative reveals some of the inherent contradictions in attempting to address flooding in the contemporary context. Knowledge regarding the difficulties with flood defence coincides with issues associated with the historical legacy of development. The long-term perspective which consideration of climate change brings into view is noted as making practices of flood defence appear unsustainable. At the same time, however, the necessities to 'work around what is already there' and the imperative to defend areas such as London, is highlighted. There are evident contradictions in conceptualising the problem and trying to imagine solutions in this difficult context. The participant finishes expressing difficulty in providing an 'answer' to the problem understood in this way.

In terms of flood defence, the difficulties appear as more complex however, than only a contrast between sustaining present conditions and acting in ways more appropriate for a long-term future, as some in areas flood defences will be retained and managed while others will not depending on economic viability (DEFRA 2006d). This situation means that in some contexts knowledge(s) relating to the unsustainable nature of present practices, which indicate the necessity for change, are acted upon (in particular ways) where in other areas they are not. This means that the distribution of

benefits and costs<sup>4</sup> to people will be uneven across England and Wales, with some individuals experiencing policies of ceasing maintenance with regard to flood defences while others will enjoy the continued benefits of defence. There are foreseeable public unrest issues that may arise from such decisions and no amount of reasoned calculation is likely to convince an individual that the protection of their home is any less important than the defence of others. The participant below highlights the difficulty in maintaining and building flood defences when climate change is expected to escalate flooding. This is contrasted there being 'no scope' for not continuing defence in the case of their region. In this respect they raise the notion of there being 'winners and losers' with regard to flooding and defence policies in the contemporary context.

There are going to be losers and winners aren't there but at the end of the day how much money, you know the government can't continue building these walls forever can they, do you know what I mean... but there's no scope for not continuing to defend here. (P.Pl. participant 15)

The arising approach involving the proposed abandonment of some areas, is not seen here as a fundamental shift towards a more sustainable future but rather as a decision taken primarily for economic reasons. It is not viewed as a solution to the problems discussed in chapter three, where the restrictive nature of historical development coupled with the knowledge relating to climate change were highlighted as creating unsustainable situations in relation to increases in flooding. These issues remain unresolved by enacting policies of abandonment in some areas, where it is uneconomic to continue with defence, while maintaining protection in areas where it is not. There are of course no easy or obvious answers to such difficulties but if the aim is to act in ways appropriate to the knowledge(s) held and in ways sustainable for the long-term future these questions should still be posed. This is not for exploration now however. At present it is important to offer insight into the participants' depiction of the problem and the obstacles to be faced in approaching flooding in ways congruent with the contemporary understanding of the issues. The participant below explains that with regard to the historical legacy of development the approach now is perhaps one of attempting not to repeat historical mistakes.

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<sup>4</sup> The framing of flooding in terms of costs and benefits and the meaning of this for flooding is discussed in the following chapter.

Its trying not to repeat historical mistakes really is what we're trying to promote, there's not much you can do about properties that are already there, well you can, but not in this country unfortunately (Pol. Participant 13).

This participant discusses the difficulties of coping with the constraining problems of previous development in flood plains and defence of such areas. They suggest that in this difficult context the approach can only be one of not repeating historical mistakes. There are however, difficulties in achieving even this as there remains a continuing trend of development in flood plain areas and the accompanying strategies of defence. The attention is thus turned to issues relating to new developments and the pressures for continuing with past ways of acting.

In addition, to the noted difficulties in defending against flooding and the continuation of such practices in economically viable contexts as well as the historic legacy of development, the participants highlighted tendencies towards the continuation of building in flood prone areas. They proposed a conflict between development pressures and the apparent necessities, with regard to flooding, to limit or stop building in flood plains. The participant below defined as a consultant gives their answer to a question regarding the dominant approach to flooding.

Well, the dominant approach seems to be from Office of the Deputy Prime Minister at the moment. They are very keen to encourage new house building particularly in the South East of England. So much so that they give targets to local authorities and local authorities have to meet those targets even if they do not have land to spare, so in many cases what they are doing is allowing development in flood plain land. (Cons.Participant 3)

In this extract the tendency for a continuing practice of construction on flood plains is posed by this interlocutor. This participant highlights the requirements for development from government and suggests that the necessity for new houses leads to the continuation of building in flood plains. They thus pose a tension between the drive for development in certain areas and the attempts to 'not repeat historical mistakes' and discontinue building in flood plains. This participant continues, noting that part of the problem is that the Office of the Deputy Prime Minister<sup>5</sup> is not tasked

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<sup>5</sup> Office of the Deputy Prime Minister is now called Communities and Local Government.

with defending properties but rather is required to create more housing to meet the needs of a rising population and the associated housing requirements (economic development and employment prosperity are also factors in this). This can be seen as relating to responsibility.

They are not tasked with defending these properties they are tasked with creating more houses. One approach that they might have considered would have been to encourage businesses to relocate outside of the South East of England so that some of the safer areas could be grown rather than trying to concentrate everything in London. (Cons. Participant 3)

In this extract, the participant asserts that the concentration of businesses, and thus the high needs for housing, in the South of England can be seen as one aspect of the problem in relation to the continuation of construction on flood plains. They highlight difficulties associated with the clustering of businesses in particular regions creating certain areas as more economically prosperous and generating the pressure for housing in areas already highly populated. These difficulties, as noted above, are not easily addressed with regards to the legacy of development. However, they could begin to be addressed through new approaches to development of the kind this participant points to. The difficulty appears to be that the historical legacy perpetuates continuation of such actions. Past trends result in the continuing concentration of commerce in particular areas and thus more development in those locations. This in turn creates the necessity for further structurally engineered solutions to flooding.

In addition, to the tension identified between housing requirements and development in flood plains the participant also highlights issues related to responsibility as contributing to these difficulties. They note that there is no statutory requirement for Government to protect against flooding and pose this as contrasting with the task of providing more housing. These problems related to development pressures and building in flood risk areas are evident in a story relayed by another of the participants. This participant explained the processes of developing in a flood risk area where there were requirements for housing issued to local authorities from central government. This account provides more detailed insight into the processes by which developments in flood risk areas occur.

The interviewee offers an explanation of their role in putting in an application to a local authority in an area in the South East of England. This narrative provides further elucidation of the kinds of issues which arise with regards to continuing development in flood prone areas. The participant explained how they entered a bid on behalf of a developer to build houses that the local authority was required to build. A development of 500 houses was deemed necessary in an area that had already been flooded during the 2000 floods. They explained how a few developers (six or seven) put forward plans to the local council to build the houses in the area. In this thesis, the participant is classified as an engineer for the purposes of analysis.

We were employed by a developer to get 'good evidence' for their site and make the other site look bad. Another developer owns the other site. There are six or seven sites in all, all with different developers all fighting to get given the approval to build the 500 houses that are needed from the Local Authority in the area. The developers employ different firms to fight their corners for them. (Eng. Participant 8)

The interlocutor denoted the other sites as less competitive than the one they were promoting and viewed only one other site as a rival in the bids; the reasons for this were not made explicit however. They continue highlighting the difficulties involved because the plans for development were all in areas that were at risk of flooding. The requirement for these houses, in this sense, evidently clashes with aims relating to the need for less development in flood plain areas. There was a target to build more houses in areas but no sites for building them which were not already at risk of flood. This narrative is thus indicative of the continuation of building in flood areas due to the pressure for further development and housing provision. Here the participant discusses the difficulties that they faced in making the case for their particular development.

The site drained in to Picklington<sup>6</sup> stream which then drains in to the River Puckley, and Puckley during 2000 had major flooding right through the town. So one of things we had to try to demonstrate is that our site, unlike the Birdseye site for example, won't contribute to additional flooding. The argument is that we would retain on our site all of the 100 year... we would attenuate all of the equivalent 100 year green field run off by using attenuation on our site. (Eng. Participant 8)

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<sup>6</sup> All names are pseudonyms.



The participant explains that the site, which they saw as their primary competition in the bid and which the local authority was favouring, would have contributed to additional flooding in the area. The continuing tendencies to build in areas at risk of flooding are evident in this description of efforts to secure a contract for development. The attempts made to secure an 'acceptably' low flood risk do not detract from the impacts that any new development will have in terms of adding pressure to sewerage systems for example. These kinds of actions can be seen as contrasting with the knowledge held in relation to development and concerns about increasing levels of flooding.

The changes in ways of living and acting with regard to this issue are not apparent in the picture painted here by this participant. In contrast, the situation appears to be more one of continuation of previous ways of doing with efforts being made to incorporate the contemporary knowledge(s) discussed in chapter four within those ingrained practices. This participant continues explaining some of the difficulties they faced in achieving an acceptable level of risk for the local authority and the Association of British Insurers. They explain how the requirements of these two institutions were different and highlight the problems they faced in achieving the acceptable risk level. These difficulties are of interest with regard to the determination of 'acceptable' levels of risk varying across institutions and indicating some contrasts in the determination of what is acceptable.

One of the problems that we faced was that it is quite a steep site, which is good in lots of ways - you know if it is a very flat site a small increase in level and you lose a lot of the site as it is quite steep even though the 100 year flood level comes up its not a large proportion of the site. The developer was quite happy with this until this business with the British Association of Insurers came up. They added this complication by saying 'we will insure properties just above the 100 year protection but they will pay a much higher premium. Above the 200 year protection there is no added premium'. So we had to start fiddling around with the site then to try and look at it in terms of whether we could quickly move the rest of that site out of the 200 year by actually building up land if you like. The trouble is, is that if you build up land then you are actually going to increase the flooding or the flood run-off in Puckley because you are taking away flood storage area. We have had quite a battle explaining that to our client; they either recognise that if we do that then the claims we have made so far, that we would not be contributing to an increase in risk of flooding in Puckley would no longer be true but they might be able to sell more of their houses because they'll all be above the 200 year flood. Or the other way around is that we stick where we are, we don't contribute

to flooding in Puckley but they have more difficulty selling those houses that they build between the 100 and 200 year contour. (Eng. Participant 8)

In this narrative it is evident 1) that the Association of British Insurers (representing the insurance companies) finds a different level of flood risk acceptable to that which the local authority would accept<sup>7</sup>, and 2) that the developer in this scenario would decide between building houses at a level of risk that the Association of British Insurers considers as high, or contributing to increased levels of flood risk in Puckley. Neither of these choices appears to align with the kinds of changes indicated as necessary by the contemporary conception of the problem of flooding. It is worth noting that the competitive nature of this particular approach to development means that the primary interest is in winning the contract for development. One of the participants indicated in their interview that this competitive approach may have an effect on the assessments of flood risk delivered to local authorities.

The developers can get a small company that doesn't really know much about what they're doing and [pauses] they can network very well with the local council and the figures change each time and you end up with a property, that is 1 in 100 year to start with, is shifted to 1 in 500 or whatever and the properties flood. I've seen it on several occasions. (Acad. Participant 7)

This participant's assertion is indicative of the difficulties inherent making changes with regard to development in a situation characterised by competition and economic drivers. The examples above of development in flood plain areas is indicative of the difficult situation apparent with regard to the conflicts between development pressures and attempts to make changes to address flooding as a contemporary problem. In addition, the more nuanced difficulties that arise in a real world context regarding the pull of differing priorities are alluded to. The extract below provides another example of the tensions noted by participants between the pressures for new housing and the need for changes regarding building in areas at risk from flood. This participant, defined here as affiliated with an independent organisation, explains their view on the need to re-think ways of living. They note the conflicts between land use and the requirements for addressing flooding in the contemporary age.

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<sup>7</sup> As previously noted some major insurers now will not insure below the 1 in 1000 flood risk.

Well, obviously we've got to re-think how we live our lives here. Flooding is getting worse because of inappropriate land use really and more and more building for instance. The deputy prime minister commissioned all these 100's of 1000's of homes in the south east<sup>8</sup> and they add to the risk of flooding. There's going to be much more runoff on people's houses, more waste water going to sewage. General day to day living creates water. (In.org Participant 10)

The interlocutor explains how housing developments exacerbate flooding through day to day living, placing additional pressures on the sewerage system for example. They thus highlight ways that developments in flood risk areas contribute to flooding beyond the heightened risk they create in taking up areas that could have provided capacity for flood waters. The construction of housing in flood risk areas arises as a historical legacy which creates difficulties discussed earlier. However, evident here are continuing practices of building in areas now thought to be inappropriate for development. Despite efforts being made to limit the impact of these new developments on flooding, the buildings created remain at risk and escalate flooding for other areas. Significantly, these actions do not appear to reflect the expectation of heightened flooding associated with climate change. If the long-term vision which climate change brings into view is taken into account, practices of building in flood plains and managing those risks for present conditions appears unsustainable in light of the increases in problems expected.

These examples from the data are indicative of the continuing tendency to build in flood plains and to defend against flooding. The role of contrasting priorities from central Government has been highlighted by another participant classified as a policy-political actor. They explain some of the difficulties to be faced in coping with the clash between pressures for development and the need for changes in addressing flooding as a contemporary problem.

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<sup>8</sup> There is a stated aim in the 2003 Sustainable Communities Plan to address the imbalance in the demand for and supply of housing in the South East of England; 'Household numbers increased by 5.4% over 1996-2001, whilst the stock of dwellings increased by just 4.6%. Housing completions are at record low levels with just under 16,000 permanent dwellings being built in 2001/2, whilst skill shortages are widespread throughout the house building industry'. The East of England Regional Assembly's has a commitment to begin development on 500,000 new homes in the east of England over the next 20 years. The aim stated in the SCP is 'to provide for the East of England's growing population, which increased by some 6% in the last decade and is projected to increase by over half a million over the period 1996 to 2021' (ODPM 2007: 28).

I mean we've been sort of lobbying Office of the Deputy Prime Minister that has the responsibility in building and planning and all the rest of it but you know they're under pressure as well so its not as black and white as we would like it to be, there are lots of grey areas. You know, on the one hand they're saying don't build in the flood plain and on the other hand they're saying, for example, the Thames Gateway project and all of those houses are all going to be in the flood plain and that's something that's being positively promoted by Government so there is always this balance to be had. It's not a black and white world. (Pol. Participant 13)

This participant highlights the difficult world in which these kinds of issues must be addressed. They refer to 'grey areas' in which seemingly important aims, associated with changing ways of acting to create a greater capacity for coping with flooding, conflict with equally strong requirements for development. They indicate the necessity for a balance between these issues, although how this balance is to be achieved appears to be an issue that is not yet resolved. It has become apparent that development pressures (associated with housing needs and economic prosperity) have a significant role to play in the continuation of building in flood plain areas.

There are a number of other noted factors that were apparent in the data which appear to play a role in stifling the changes posited for addressing flooding in the contemporary context. The data revealed some conflicts between political priorities related to other environmental issues and the proposed need to re-dress development practices with regard to flooding. One such tension noted by participants is the government priority for brown field sites<sup>9</sup> to be favoured over green field sites. The reasons for such a policy relate both to processes of regeneration and to preserving green belt land for environmental conservation. These priorities, however, tend to conflict with the aims of limiting development in flood risk areas, as many brown field sites are also flood plains. The participant below is classified as affiliated with the insurance sector. In this extract they highlight this contrast between government priorities.

The Government's targets to use brown field land are really driven by wanting to protect the green field sites as much as possible. We felt quite strongly that some brown field sites just were not suitable for developing

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<sup>9</sup> The term 'brownfield' site refers to previously developed land that was occupied by a permanent structure, either commercial or residential, which has become vacant, underused or derelict and has the potential for redevelopment. The Government has an aim to see at least 60 percent of all new development on brownfield sites and this has been laid out in PPG3 on housing.

into housing. There had not been housing in the first place and probably never would have been. They were industrial uses, often ship yards or docks or something that by their very nature had to go along side the water and were organised in such a way that they were tolerant of the odd bit of flooding whereas people's houses are not. (Ins. Participant 9)

This participant points out that brown field sites are often flood plain land and, although they have been built on before, the prior developments were often more 'tolerant' of flooding. The difficulty in contrasting priorities with regard to this issue is alluded to by another participant in the extract below.

Previously developed areas are in flood plains because a lot of former industry and so on was located in flood plains to transport supplies and all those sorts of things, so they do tend to be sites of flood risk and there is quite a lot of pressure to re-develop those sites rather than green field. There is a national policy to prefer brown field to green field sites when allocating new development um... clearly there is also a national policy that we avoid putting development in areas of flood risk so those two things obviously can come head on. (Pol. Participant 12)

This participant notes the tensions between maintaining flood plains and preserving undeveloped sites. Underpinning these difficulties is the continuing pressure for development. It should be made explicit that development is a highly profitable industry contributing significantly to economic prosperity. The drive for development is thus an imperative associated with capitalist societies and associated economic practices of profit generation and investment. It forms an integral part of the present way of life yet it also raises problems for coping with flooding in the contemporary age. The difficulties that building past, present and future poses for flood risk and the contrasting importance of development for contemporary society has been noted by participants. The participant cited below is defined here as an engineer and has worked in various different roles in relation to flooding. They point to the significance of development pressures for a capitalist society.

I think the third you know really big thing is development pressures that we are, you know that we do live in a capitalist society and that we can not stop people really having some form of development which is always a tension putting pressure on the environment. Whether it's pressure from building, whether it's pressure on as we saw - you were there yesterday - looking at the fact that farmers are under pressure to get more yield out of their fields so land, pressures from development and from you know capitalist society are really, really major things to grapple with. (Eng. Participant 1)

In this last extract the participant poses a tension between development demands and 'pressure on the environment'. They highlight the links between development and the requirements of capitalist societies. They deliver two examples of the difficulties posed for flooding in this respect, highlighting both pressure for building and contemporary industrial farming practices as engendered by needs associated with capitalist society. The participant refers to a paper delivered at a conference on flooding, whereby local farming practices were highlighted as a highly significant part of the reason for extreme floods in a particular area (Hall, Davies, Trapmore, and Thurley 2005). The links made in this statement between various practices and the drives of capitalism are indicative of the tensions arising between the contemporary way of life and the problems identified with regard to increasing flood risk.

This kind of view contrasts with the assertions that authors such as Spaargaren and Mol (1992) have put forward regarding the 'ecological switch' of the industrialisation process in a direction that takes into account the maintenance of the existing sustenance base (Hannigan 2006). The findings of this research indicate that the transition to more sustainable practices is not likely to be smooth in the way depicted by Spaargaren and Mol (1992). O'Riordan and Voisey (1998: 4) in their analysis of sustainability explain that 'humanity is neither culturally nor organisationally structured to cope with the transition'. They explain that the logic of institutions is to only 'vary marginally the status quo', raising important difficulties for shifts to more sustainable ways of life (ibid.). The contradicting priorities and clashes in exacting change shown through this analysis are indicative of these kinds of difficulties that arise in attempting to align practices with contemporary knowledge(s) relating to non-sustainable ways of doing.

This analysis of flooding in the contemporary age has revealed that there are significant tensions between the need to address this socio-environmental issue and the demands of industrial capitalist development. With regard to this particular issue there are difficulties apparent in addressing the problem, as it is understood in contemporary England and Wales, within the constraints of capitalist society. This is not to suggest that efforts to implement changes in approach are not apparent, merely that there are significant barriers to achieving the kinds of shifts which appear as

necessary in light of the contemporary understanding. The participants in the study indicated that it takes individuals with a 'special interest' to find ways through and implement important changes for addressing flooding in the contemporary context. Such efforts for change occur in a context where it is necessary to work against current practices and ingrained ways of doing things. The participant cited below provides an indication of this sense of difficulty in achieving change within present constraints.

Central Government gives local authorities so many things they've actually got to do that it depends either on a elected member or an officer of a council being an enthusiast in some way, or it depends on bridging the gap between their sort of duty of care to the community and persuading them that this must include looking at climate impacts; that's quite a slow process. (Sci. participant 2)

This participant explains that the pressures associated with meeting the demands of contemporary capitalist societies create difficulties in acting upon climate impacts, in this case flooding. They suggest that it requires an 'enthusiast' to persuade local authorities to include consideration of issues like flooding, as a climate change impact, in their work. In line with assertions put forward previously the participant indicates the existence of gap between the tasks associated with sustaining the way of life, described as a 'duty of care to the community', and the task of grappling with climate change impacts. As noted this gap is only bridged by people with commitment to sustainability working above and beyond the calls made upon them by their role within an organisation. Bluhdorn and Welsh (2007) point to this kind of institutional inertia as important in delaying change.

It is proposed here that continuing pressures for development clash with the changes in ways of doing which the contemporary understanding of flooding as a problem appears to require. There are thus conflicts noted between priorities associated with development and those for tackling flooding. The difficulty in conflicting priorities is that, in the end, one must take precedence over the others. It seems that development is often prioritised over the need for the change in actions important for tackling flooding in the contemporary context. It appears that acting on the changes in the understanding of flooding have been limited with regard to development practices. This issue has been noted as relating to economic pressures associated with

development, the requirements for more housing in already densely populated areas, and political priorities with regard to re-development and preservation of green field sites. These pressures are explicated here as examples of the obstacles that are apparent in making changes to action in ways more appropriate to the contemporary understanding of flooding.

It is suggested that change is hindered by the nature of the transition required to tackle flooding as it is understood at the present time in contemporary England and Wales. The shifts in practices relating to adapting to flooding for the long-term in light of climate change involve altering ways of doing integral to the current way of life. As a western, capitalist society, making changes, such as limiting developments, runs against the grain of established and ingrained ways of acting, against the pressures required by the current system and as such, there are significant barriers to change which are integral to sustaining the present way of life. It is posited that the centrality of these obstacles for current ways of life results in the continuation of practices that appear unsustainable in terms the contemporary understanding of flooding. Welsh (2007) points these kinds of difficulties as entailing a contrast between the pace of cultural change and the urgency required for addressing climate change. The discussion thus far has related to the issues in tackling flooding associated with developing flood plains and continuing practices of hard flood defences. The following section entails discussion of some of the different approaches (briefly discussed in relation to the policy in chapter five) that have come to be seen as more appropriate given the contemporary understanding of the issues.

### **Disputing Different Approaches**

Thus far the continuation of previous practices with regard to flooding has been noted, and the tensions surrounding the necessary changes in action have been discussed. In this section the extracts of data which pose issues regarding different or new approaches to tackling flooding are examined. The approaches to addressing flooding discussed in this section are not new *per se* rather they are given more emphasis, in light of the current understanding, as more sustainable ways of dealing with flooding. The discussions above pertain to the limitations on change, considered important for



dealing with flooding at present. The data, however, revealed conflicting views with regard to the aims for change.

In this section these disputes relate to three primary approaches which differ from defending against floods, a practice revealed as difficult to maintain. These different strategies around which disputes were apparent are flood warning systems, building in resilience and managed realignment. These are offered here as three examples of different approaches to flood management, in contrast to flood defence. The difficulties with these management strategies not being applicable in all areas, where defences are maintained, have been noted. This section entails an elucidation of the narratives which pose issues with regard to these particular approaches to flooding in the contemporary context. A brief explanation of these strategies is required.

First, flood warning entails the notion of delivering warning to those at risk from flooding by some means (text, telephone call, website notices), so that individuals can take action to limit the damage, for example, by moving expensive equipment to higher floors or using flood protection gates. Secondly, building in resilience is the notion of building properties in flood risk areas so that they are tolerant of floods, this could also be applied to houses already in the flood plain through adapting them to be more resilient. Finally, Managed realignment is an approach posited as a means for adapting to the long-term changes that are expected with climate change. It involves the deliberate realigning of existing river, estuary or coastal defences. In practice this can mean retreating to higher ground, constructing a set back line of defence, or widening a river flood plain (Ledoux et al 2004). These particular approaches, as might be expected given the assertions above, have thus far not been widely implemented. In this section the difficulties that participants associated with adopting any of these strategies are discussed.

The proposed responses to the contemporary understanding of flooding are viewed by some participants as resulting, not in an effort to change practices that are seen to escalate the likelihood of flooding, but in an emphasis upon ways of coping that remain within present and past ways of doing things. For example, the shift to a flood warning approach is highlighted by the participant below as placing the emphasis on individual responsibility rather than for example, a shift in the approaches to

development. This participant is classified as affiliated with an independent organisation. They explain that the new direction appears to entail an emphasis on individual responsibility. Indeed, there was a noted focus on the need for individual engagement and education as an alternative to hard flood defence in the interviews.<sup>10</sup>

Interviewer: What in your view is the dominant approach being adopted towards flooding in England and Wales?’

Participant: Well, I think they are backing away from flood defence and definitely going into flood management so therefore they’re putting the onus back on the person that’s at risk because everything I’m going to at the moment with the environment agency for instance, is launch of flood strategies and that really is... they’re resting now on flood warning or better flood warning. Flood warning direct, which is going to be launched in the autumn, is sort of a multimedia approach to flood warning rather than hard defences, and that’s something I find quite worrying really.

Interviewer: In what sense?

Participant: The fact that they’re not they’re not going down the road of protecting people. You know flood defences are actually being cut back on and flood warning is on the increase and I think that there’s not enough money being sunk in to flood defences, if you pardon the pun, and that has to stop obviously with the chancellor of the exchequer and if they actually put more money into flood defences particularly for areas that are regularly flooded then people’s life would be made a lot easier if they hadn’t got to worry all the time about flooding which is something that is not their fault directly but they’re having to pick up all the pieces for it.

(In.Org Participant 10)

This participant explains their view with regard to the different approaches proposed in the policy, focusing particularly on flood warning. It is clear why any individual who experiences flooding would want flood defences and be concerned about any policy position which advocates a strategy of living with flooding. Indeed, it appears entirely reasonable that a person would not want to be flooded, particularly if they are aware that there is a means by which they could be protected from such an event. In addition, such concerns are exasperated further by the knowledge that some flood defences will be maintained based on economic viability. Thus, some will take on a greater share of the burden than others. It is also clear, however, reflecting on the previous chapters, why such a policy position is arrived at given the particular policy context or framing. This is an area where there is potential for political problems in the future should - as is expected - flooding increase. This is not the focus here but is an interesting point that could form a point of departure for further research.

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<sup>10</sup> This can be seen as connected to a more general growing trend towards individual responsibility (e.g. Rose 1999). These assertions however, are not the focus here.

The above participant's view of flood warning systems and moves away from defence as worrying represents a very different view concerning the current approach and the direction they would like to see emerging. This difference in views can be interpreted as related to the differing ways in which the issues are seen i.e. a policy maker may look at the overall picture and the longevity of sustaining defence and decide that it is not feasible. A person that is to be affected by an expected increase in flooding, however, may expect a heightened level of investment and protection given the present understanding that it may increase. This has a temporal dimension worth considering regarding those at direct risk of flood perceiving the immediate threat to themselves and their home versus decision-makers taking a longer term view of the risk. This participant's concerns regarding shifts towards flood warning systems were also raised by other participants.

Earlier in this chapter, policy participant 13 noted the issues with not defending properties and taking up strategies of flood warning. They explained that the only way to protect properties and people from flooding was 'to build a wall around them' and that the warning policies are contingent on human agency and people actually responding. Participant 12 noted the inherent difficulty that shifts to policies of flood warning will divert funds away from policies of defence, which for those at risk of flooding is likely to remain the preferred option. In this sense there is likely to be political pressure for protection from flooding despite the noted difficulties that this poses in acting upon flooding for the long-term. The legacy of defending against floods, as well as the continuation of defence for those areas where it is economically viable, is likely to make the shifts to other means of dealing with the issues difficult politically. This is in addition to the issues already noted in exacting change.

The proposals relating to resilience have also been questioned by participants. This participant explains that developing *resilient* new houses in flood plains will still increase flood risk for the area.

Even if you build resilient properties they still increase the overall flood risk for an area. (Ins. Participant 9)

This relates to knowledge(s) regarding the effect that development has in increasing pressure on sewerage and drainage systems, as well as on available levels of flood storage. The limited implementation of resilience policies thus far has already been noted. In the context of new development there are foreseeable difficulties with regard to policies of resilience. Issues may arise with regard to the willingness of developers to build flood resilient houses. For example, the presence of flood resilience technologies will indicate to buyers that the house is at flood risk. This may lead to a reduced premium for which developers can sell the houses. There is thus no economic incentive for such an approach at present and therefore regulation may be important in pursuing this kind of approach. The primary issue raised by the participant above however, is that even where houses are made more resilient to flooding, development in flood plains still exacerbates flooding problems for surrounding areas.

In addition to the difficulties and concerns regarding warning systems and resilience, issues in achieving managed realignment and retreat have been noted by participants. Below a participant in the study highlights difficulties inherent in implementing approaches of managed realignment. It is important to note that this option still requires that a cost-benefit analysis be met, as for any flood management option investment is required. This approach is thus an alternative to flood defences (and other options) and should be distinguished from the decisions to stop maintaining defences in some areas. Participants have noted the difficulties involved in applying this approach to flood management in areas where other options could be applied. This participants comments are interesting on several levels, they are thus worth quoting length.

Participant: It highlighted one of the things about managed retreat for me, it is a nice idea in theory but it's always somebody's land. I mean if you take Baxton<sup>11</sup> with the sea front I mean you can't have managed retreat there it would wipe out half the real estate, you know, so that's not going to happen. They are absolutely adamant they want their hard defences protected. Come a bit further along the coast you've got Tevansy and Tevansy wetland, which are important areas of habitat and of course the conservationist do not want to see managed retreat there because it would be losing important habitat. You come a bit further along and there is invaluable farmland and of course the farmers are quite wealthy and quite important land owners. So in reality trying to get managed retreat to work anywhere is like beating your head against a brick wall. We had exactly

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<sup>11</sup> All names are pseudonyms.

the same thing in the Bees Estuary shoreline management plan, to the point where Hive council were going to sue the Environment Agency because managed retreat was one of things that was promoted for a bit of land between Hive and, I can't remember where it is, and the local authority said 'if we have managed retreat there, because it's on the Sherman levels, we'll almost become an island and if you think we're going to stand back and watch ourselves become an Island you've got another thing coming'. So you know, these things are nice in theory and if you like academics promote them but to actually see them happening is very difficult.

Interviewer: Because people have different priorities?

Participant: Well, everybody's got their own priority and their own agenda and unless somebody is going to be dictatorial these things they won't happen, and in the planning policies in this country nothing is dictatorial. (Eng. Participant 8)

This rather lengthy quote includes similar views to those discussed in the previous section of this chapter regarding the feasibility of managed retreat in some areas. This participant also details other concerns with regard to such policies, including the difficulties likely to be felt in achieving consensus on the matter of who sacrifices land. A strategy of managed retreat involves a very different agreement to that required when delivering flood defences. Hard flood defences provide people with protection and allow for the continuation of 'life as usual'. Managed retreat by contrast involves a fairly significant degree of sacrifice and change which is suggested, by this participant, to act as a significant barrier for the success of such policies even in areas where it is a feasible option.

The feasibility of a policy of managed retreat for certain areas has been highlighted as an issue by several participants. However, managed retreat is clearly not presented as a solution for all areas but forms one option in a 'portfolio of responses'. The quote above, however, indicates more general difficulties that may arise in attempting to implement plans of managed retreat in *any* area. They raise concerns regarding the possibility of strong opposition to such plans by those directly affected. The participant below draws attention to a further area of difficulty in relation to plans to implement managed retreat as a portfolio option. They note problems that arise in applying a strategy of retreat to some areas and not others. The quote below is taken from a professor of civil engineering whose work relates specifically to flooding.

If you're going to let nature take its course, you have to remove all the bridges you have to remove things like the Millennium stadium which are

forcing the river. You have to remove all the housing opposite you can't have managed. You can't leave the river to take its natural course in one place and then fix it somewhere else. It has to be a holistic view. There may be certain circumstances where you can but in a whole range of conditions it's a joke, you actually make things worse. Once you've interfered with nature somewhere, you then have to look at the whole system and manage the rest of it as best you can within those limitations. (Acad. Participant 7)

This participant draws attention to a difficulty in implementing such policies where there is already a strong legacy of development that has followed a particular trajectory. From their perspective, the restraints that previous developments create make policies like managed retreat an inoperable solution in many cases. This participant's view thus constitutes a contrasting outlook to that found in the dominant socio-political discourse. They suggest that the practical implementation of some of the strategies put forward which work '*with* natural processes' (DEFRA 2005: 15) are counter productive in certain instances.

The final statement that appears relevant for this section, relates to the extent to which hard defences represent a solution, shedding light on a different aspect of contestation. In some senses, this argument runs in concurrence with the view that hard defences are not the solution. In contrast to other perspectives however, this participant suggests that they are ineffective as a *partial* solution. Concerns relating to a piecemeal approach to hard flood defence are noted by this participant<sup>12</sup>.

What the EA expect individual developers to do is to do their bit, but until all the developers have all joined the bits together you haven't got any protection. We keep pointing this out and the attitude is 'well eventually it'll be alright'. Well, maybe but I mean if somebody doesn't bother to do their bit of development or can't afford it - if the last brick in the wall isn't there we've all wasted our money anyhow. We keep pointing this out, if they are really serious about these levels then they should be doing this as a matter of policy, not waiting for individual developers to come up and start building. (Eng. Participant 8)

A paradox becomes apparent whereby hard defences are identified as not providing an adequate long-term solution but are also necessary for many areas given the legacy of development. The participants raise overall concerns regarding difficulties in

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<sup>12</sup> It is worth noting that there have been (and continue to be) attempts at implementing a more strategic approach to flood defence (e.g. taking a catchment wide approach or implementing shoreline management plans) but thus far these have not been implemented.

implementing managed retreat in many areas. There are also issues regarding which people are allocated defences and which are to incur the penalties that managed retreat might entail<sup>13</sup>. Questions thus arise in relation to the proposals to apply hard defences in some areas and strategies of managed retreat or individual responsibility in others. As has already been noted defences require little sacrifice where other policies are likely to involve more significant losses.

This means that strategies of managed realignment require collective willingness by particular communities to make changes. It is suggested here that this is achievable but requires more time, planning and consensus building than hard flood defence options, making implementation more difficult. These requirements are noted to contrast with temporal structures associated with contemporary capitalist societies where speed is valued. Earlier data was discussed that revealed concerns regarding the notion of shifting away from strategies of flood defence. This is particularly problematic given that some areas will be protected by defences while others will not. This makes difficult the notion that some will accept differing strategies, such as managed retreat, while flood defences continue to be constructed elsewhere.

The narratives delivered by the participants paint a picture which begins to appear Kafkaesque. The strategies for tackling flooding in the contemporary context detailed in chapter five are revealed as entailing complex difficulties for implementation. The participant's comments raise concerns regarding the policy direction and represent contrasting perspectives on the practical feasibility of some of the strategies proposed. There noted institutional limitations on capacities for carrying out the strategies, as well as issues relating to the extent to which such approaches are enough to ensure a sustainable approach. In this sense the risk management policy masks the inherent complexities and seemingly insurmountable difficulties that the contemporary understanding of flooding creates. The role of knowledge relating to climate change has been alluded to but left largely implicit in the analysis thus far. This next section entails analysis of some of the data in which climate change was raised in a different sense to that discussed in chapter four.

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<sup>13</sup> It is important to note that the participants whose views have been cited relating to the feasibility of managed retreat are all civil engineers. This may give them a different perspective on the issues.

### **Climate Change as Controversy**

The conception of flooding as a climate change impact has been posited as a dominant understanding of the issue and has been demonstrated as prevalent throughout the discourses. However, there were noted disputes in the data with regard to this aspect of the framing, whereby participants expressed cynicism regarding the links between climate change and flooding. These narratives take various forms ranging from disbelief about the reality of anthropogenic climate change, to a concern that discussion of the issue is merely political rhetoric rather than an indication of political will to act. The data discussed thus far has related to the difficulties in exacting change and finding approaches appropriate to the contemporary understanding. From the extracts discussed in this section it is possible to see that there may not be agreement on the understanding of flooding as a problem. Thus, for some the debate remains at the level of establishing the nature of the issue, rather than in addressing the difficulties concerning how to move forward. These controversies are posed here as potentially being in part due to the nature of the climate change issue.

This first extract is taken from an interview with a participant labelled for the purposes of analysis as a consultant. In this citation the participant expresses cynicism about the extent of the permeation in policy and practice of the concerns about climate change in relation to flooding. When asked for their views on how climate change features in flood policy and practice this participant replied as follows.

Lip service I would say really, I don't think it features significantly. UKCIP [United Kingdom Climate Impacts Programme] does a tremendous job but the planning authorities don't seem to be very much aware of the circumstances and the situation really' (Cons. Participant 3).

This interlocutor explains that they perceive the links between flooding and climate change as only amounting to 'lip service'. They thus note the discursive links being made between climate changes and flooding but express the view that this is merely rhetorical. The issues that climate change raises in relation to flooding are posited by this participant as not having been integrated into decision-making in significant ways at the planning level. This narrative does not represent a dispute about knowledge relating to climate change itself but rather an assertion, that the issues are not yet



embedded in the consciousness of the some of the communities which have a role in relation to these issues. It is thus posited that there are issues in the contemporary understanding of flooding, discussed in chapter four, filtering to all areas wherein these issues would need to be addressed.

The extracts discussed next entail disputes regarding the issue of human induced climate change and thus the purported links between this and flooding. In addition to this, participants expressed cynicism about the ways that the necessity to consider climate change translates into practices, particularly the noted outcome of building higher walls, the difficulties of which have previously been discussed. These concerns link to the difficulties expressed in relation to development and flood defence. The practice of building higher walls appears unsustainable if the extent of the changes - expected with climate change - is taken into consideration. These overlaps in the analysis will be expounded when relevant for the following discussion. The following extract is taken from a participant with a role in relation to policy.

I just think if you look, I'm mean I'm going against all of the best professors now and all the rest of it, but if you look historically at records of flooding, and you know we talk about the great flood in the 1700's or whatever, now I don't know what caused them then and whether they were any more frequent than the stuff that we've seen today or whether we're just going through another peak, it tends to historically go through sort of peaks and troughs in terms of bands of weather. Now it may be that it's just another peak that we're heading towards or it might be climate change. I'm not massively convinced that all of what's happening today or indeed in the last 10 years is attributable to climate change necessarily.  
(Pol. Participant 13)

This participant expresses their personal views in relation to climate change. They offer their view that the increase in flooding events may not be due to human induced climate change, suggesting that they are unconvinced by such a notion. They continue after the extract presented above indicating a cynicism regarding the political stance on the issue and its connection to flooding events. Below another participant classified as a policy-political actor also indicates a cynicism with regard to the links made between climate change and flooding. They refer to a fictional book on climate change that depicts the issue as a politically created concern. In response to a question relating to their views on climate change with reference to flooding they answer.

Have you read Michael Crichton's<sup>14</sup> book? Well it's an interesting read... his latest book is 'State of Fear', this is an individual talking not a representative of \*\*<sup>15</sup>, but he is sort of poking fun. Well there's an issue there that's worth reading about. Basically what he is doing is questioning the science behind climate change and also questioning as well the role of Governments in seeking to create something that drives and gels large communities. Well, the issue that I have, within \*\* you are preaching to the converted, it is not the Michael Crichton approach of challenge it is one of acceptance and therefore incorporation in designs and practices. (Pol. Participant 5)

The book by Michael Crichton which the participant refers to here is a fictional novel entitled 'State of Fear' published in 2005. This book is not entirely fictional but draws on some scientific research and other secondary materials to develop the fictional plot line. Incidentally, the storyline is one where green activists plot to induce environmental disasters in order to convince others of the urgency to act on climate change. The discussion of this book as a knowledge artefact is not for here but may form an interesting point of departure for further research on the nature of these forms of writing and others like it, particularly in relation to the notion of expertise<sup>16</sup>.

For now, however, it is noted as interesting that the participant draws on a [largely] fictional account of the issue to express their views. This could be conceived as indicative of the difficulties noted previously in relation to climate change regarding the time lag between causes and effects and the consequent lack of visibility associated with such an issue. Significantly, these examples indicate that there is scepticism regarding the notion that flooding is being escalated by human induced climate change. This scepticism points to of conflict in the definition of flooding as a problem. The extract below is a further example of an exchange between interviewer and a participant where, similarly, uncertainties were expressed in relation to this particular aspect of the delineation of the problem of flooding. The participant below is defined as an engineer for analytic purposes.

<sup>14</sup> Crichton, M (2005) *State of Fear*. New York: Harper Collins

<sup>15</sup> \*\* refers to the institution they work within.

<sup>16</sup> The analysis of the spectrum of texts which entail translations of science, from fictional texts to peer reviewed academic publications, could be an interesting research topic in its own right. The Sociology of Scientific Knowledge literature around extension and so called 'third wave' science studies could provide a source for informing such an enquiry. (Collins and Evans 2002; critical responses Wynne 2003; Jasanoff 2003; rebuttal Collins and Evans 2003)

Interviewer: What are your personal views on climate change, in terms of human induced climate change?

Participant: Do I believe it?

Interviewer: Yes

Participant: I certainly believe there are changes - whether it's caused by the greenhouse gases per se I am not so sure.... So do I believe in climate change? Well yes I do, because as far I'm concerned it's been going on since time immemorial. Whether its human induced I'm not so sure.

(Eng. Participant 8)

This interviewee expresses uncertainty regarding the notion that the climate is being affected by human activities. They delivered a long narrative discussing natural variations in climate before concluding that they are uncertain about the impact of human actions. The apparent conflicts relating to climate change could be seen as a reflection of the particular contours of this issue and the reliance on scientific and policy institutions for its reality as a social issue. Ungar (2000: 297) has cited 'a sense of *immediate* and *concrete* risk with everyday relevance' as important for ensuring understanding and action towards issues. He suggests that in this respect the climate change fails on all counts. These issues are explained differently across literatures.

While for Ungar (2000) it is a matter of framing and communicating an issue in different ways, for some authors this difficulty in relation to climate change is connected to the nature of the problem itself and the conceptual difficulties that such an issue raises for ingrained ways of thinking in contemporary industrial societies (e.g. Beck 1992a; Adam 1998). Beck (1992a), for example, designates contemporary risks (of which climate change can be classed as one - however this discussion is for later) as particularly susceptible to societal definition and thus as more likely to engender conflicts in interpretations. He explains that contemporary risks

...generally remain invisible, are based on causal interpretations, and thus initially only exist in terms of the scientific or anti scientific knowledge about them. They can thus be changed, magnified, dramatized or minimized within knowledge, and to that extent are particularly open to social construction and definition. (Beck 1992a: 23)<sup>17</sup>

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<sup>17</sup> The discussion of Beck's (1992a; 1996) conceptual distinctions between contemporary risks and the risks of industrial order are discussed and clarified in a later chapter wherein the theoretical notions embodied in his work (amongst others) are utilised for their capacity in allowing insights into the issues discussed herein (see chapters eight and nine).

The nature of knowledge concerning climate change is posited here as playing a role in the differing perspectives which arose in the discourse in relation to climate change. Temporal differences regarding the extent to which the causal relationship is traceable have been noted as making issues in terms of land use and development easier to accept in contrast to climate change. Adam (1998) has asserted that the difficulties associated with comprehending and addressing issues, which are temporally distanced in their causes and effects, is in part due to the temporal habits of mind associated with a socially constructed temporal scale - i.e. clock time - and the notions of empirically observable cause and effect embedded in the scientific world view. These habits of mind are seen to permeate assumptions about scientifically defined issues in wider society. For Adam, environmental concerns which occur within natural timescales and are temporally distanced in their causes and effects are thus incongruent with embedded notions associated with science.

These notions with regard to the habits of mind that permeate industrial societies can be seen as a potential reason for the controversy apparent with regard to climate change and its connection to flooding. In this respect, it is worth noting that these participant views with regard to climate change contrast with their acceptance of the other difficulties associated with the contemporary understanding of flooding as a problem e.g. development pressures. In regard to the problems of land use and flood defence the causal relationships between, for example, building a flood defence and water being forced to another area, are more easily accessible. This temporal difference between the issues may provide some explanation for the differences that appear to arise in accepting the connections between climate change and flooding in contrast to the other aspects of the contemporary understanding.

It is posited that if the knowledge through which flooding is understood as a contemporary concern is in dispute then this indicates a level of ongoing debate which defers any will to act on such an understanding. This is of particular pertinence in a situation where personal individual motivation is apparently important in driving shifts in practice within a system where conflicting priorities compete for precedence. Previously in this chapter assertions were made regarding the necessities for enthusiasts to drive change in relation to this issue. This is highlighted again in relation to the data in the next chapter. However, for now it is worth noting the

significance of these narratives in the context of issues which require changes that entail a willingness to work against ingrained and established ways of doing.

In the previous section some shifts in practice with regard to development have been referred to e.g. planning flood storage or attenuation as part of new developments. There is also guidance issued by the Department for Environment, Food and Rural Affairs for taking climate change into consideration in development and particularly in building flood defences. This national guidance represents an attempt at the epistemic closure, necessary for climate change to be incorporated in flood designs. It entails recommendations regarding increases in flow in relation to fluvial flooding and heightened levels of defence for sea level rise. These recommendations are discussed in more detail chapter eight and thus will not be detailed now.

However, of interest for at present is the implementation of such estimates and the results for practices. The impact of such an approach to climate change in practice is in many instances to build higher walls<sup>18</sup>, for example a flood wall will be built x mm higher to take account of climate change at a rate of x mm per year for x years into the future. The difficulties with building higher walls and the problems in shifting away from such an approach have already been noted and will not be reiterated. Yet, it is worth noting at this point that the incorporation of climate change estimates in flood risk calculations does not necessarily result in capacities to cope to with the implications of understanding flooding as a climate change impact.

It is thus significant, and perhaps problematic, that the ways in which the inclusion of climate change estimates can translate into practice, is through the construction of higher flood defences, in the case of coastal flooding and in designing flood defences to withstand increases in flow for fluvial<sup>19</sup>. It is posited that there are inherent difficulties in actually finding ways of acting appropriate to the knowledge and derived calculations. It is not merely a case of including estimates in calculations but

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<sup>18</sup> This outcome was evident in schemes which participants described (an example is discussed in chapter nine) and was raised by several individuals in discussions at events attended as part of the research.

<sup>19</sup> Fluvial flooding refers to flooding from rivers. There are four primary types of flood event, fluvial, coastal, groundwater and surface floods. The term 'surface flood' refers to floods which occur due to drainage systems being overwhelmed. 'Groundwater floods' indicates flooding from springs and winterbournes.

of finding different ways of actually tackling the issue that are reflective of the knowledge held. These matters will be returned to in chapter eight. For now it is the disputes in relation to climate change and its connection to flooding that is of interest.

There is evidence in the data that the indeterminacies in knowledge with regard to climate change and the scepticism that some institutional actors have affects decisions regarding flood management. The disputes relating to the understanding of the issue can thus be seen as a barrier to creating change, as the discussion remains at the level of definition and knowledge rather than at that of solutions and ways forward. This appears to be despite the apparent attempts at the institutionally asserted epistemic closure with regard to this issue.

In the interview exchange below, the participant recounts their experience of negotiation over the inclusion of climate impacts in flood risk analyses. They depict the incorporation of climate change estimates as an inconsistent practice with space for negotiations to arise at local levels. The participant cited here is classified as an engineer. They are a specialist in environmental aspects of civil engineering.

Participant: We've had a similar one with the debate on Nine Oaks, the project I told you about there. Where, to allow for climate change there was a 20% increase on the rainfall figures. So we designed on the 1 in 100 year estimate, so many millilitres per hour. Then they wanted us to design on a 20% increase on the premise that a 20% increase was to take account of climate change over the next fifty years. We argued that was ridiculous; where did the 20% come from? And, after a lot of debate, about whose papers we'd read and so on, we came to a deal which was 10%. Now I'd like to say that was based on sound science but it was purely, basically a horse deal, because they couldn't prove 20%, we couldn't prove 0% and we ended up with 10%. So that's the sort of lunacy we get in to. (Eng. Participant 8)

Interviewer: You've talked about a few cases in which climate change was an issue. Is climate change being factored into flood risk in a consistent way across all cases?

Participant: No it depends where you are what office you're talking to, which planning authority... and they all have totally different approaches. Some old fashioned ones don't believe in it. (Eng. Participant 8)

The negotiation above is in relation to fluvial or river flooding. The narrative here provides a picture of the complex interactions which occur in day-to-day activities and is indicative of the extent to which institutional structures and procedures are not always followed. In some senses this could be posited here as a positive observation

in that those procedures which hinder changes can be exploited through the windows that appear in locally negotiated action. However, in this instance the resultant outcome is not a negotiation through which attempts are made to shift ways of doing within an agreed framework of understanding. Rather, the process appears as a debate over calculation. This can be seen as a further indication of the significance of the role of individual actors in personally pursuing issues such as this and attempting to exact changes. There are clear difficulties for those that would wish to pursue such action however, as the debates appear to stagnate in some instances at the level of calculation and technical arguments. In this participant's description of the practice of factoring climate impacts into flood risk assessments, it is therefore possible to see how epistemic uncertainties re-emerge. The indeterminacies, associated with knowledge about the likely impacts of climate variation on flood levels and flow, appear to be important in local negotiations. Despite national guidance and the dominance of the climate change frame with regards to flooding, the disputes continue over evidence and calculation. Attention remains diverted to technical questions associated with calculation; the thought which still needs to be given to finding ways of shifting practices is stifled in this sense by settling on disputes over calculation.

### **Concluding Remarks**

This chapter has provided insight into difficulties in implementing strategies that underpin the new risk management approach delineated in the previous chapter. Putting the proposed solutions into practice is protracted by clear difficulties in exacting the kinds of changes proposed. The discussion here has shown that the aims of the new policy conflict with other government priorities and are stifled by institutionally ingrained inertia. It is possible to see that efforts are being made to include consideration of the impacts of climate change and knowledge of the difficulties associated with development practices and defending against floods in decisions and practices with regard to flooding. However, it is equally clear that these efforts occur in an immensely difficult context. This results in a situation whereby past and present practices, of the kinds associated with the causes of the problems, are continued.

Three areas have been discussed in this chapter where noted difficulties in exacting change are evident. Broadly, these relate to 1) difficulties associated with the continuation of engineering hard flood defences and development practices, 2) issues relating to the new approaches for tackling flooding, and 3) disputes relating to climate change and the links to flooding. Participants in the study discussed concerns generally related to these three areas which were indicative of the complexities inherent in achieving change and finding a way of tackling flooding appropriate to the contemporary context. The complex nature of the changes important in achieving a means of dealing with flooding appropriate to the current understanding is evident in the discourses.

In relation to defence and development there are noted pressures associated with capitalist societies that create difficulties in implementing changes which align with current knowledge(s). For example, discontinuation of building hard flood defences is difficult in contexts where there is a past legacy of development in flood plains. Shifting new development away from flood risks areas is still apparently limited in implementation, despite tendencies to build on such land being characterised as a 'historical mistake'. The balancing of pressures appears to remain skewed towards favouring continuation of past actions over new solutions. Changes in approach with regard to flooding must be enacted in a paradoxical context where there remains an imperative to protect the legacy of development despite the difficulties that current knowledge indicates these kinds of approaches cause. It has been asserted that the decision to abandon maintenance of defences for some areas, while continuing to protect others does not amount to a new sustainable approach. While it represents a different approach, it is based on a purely economic rationality rather than constituting a significant change towards a sustainable practices. Indeed, in terms of sustainability there are foreseeable governance issues and social injustices that arise with regard this approach (Milligan, O'Riordan, Watkinson, Amundsen and Parkinson 2006).

The participants in the study also highlighted difficulties with regard to strategies proposed for tackling flooding. Notions of building resilient properties were noted as requiring greater incentives or regulation in terms of new development and as problematic in the sense of not representing a change in development practices; i.e.



the role that development has in escalating flooding (e.g. in terms of adding to pressures on sewerage and drainage systems) remains unresolved. Difficulties and concerns with regard to strategies of managed retreat and flood warning systems were also evident in the data. Further, the uncertainties associated with climate change and continuing disputes over knowledge with regard to this issue appears to have a role acting as a barrier to pursuing and enacting changes.

The pace of change is slow and the reasons for this appear to relate, in part, to imperatives to sustain the present ways of living. Even where there are changes, the interpretation of these into practice does not appear to align with the kind of long-term vision needed. For example, the heightening of sea walls (in areas where it still economic to build them) to account for sea level rise does not seem to represent the kind of changes implied by contemporary knowledge(s). This approach is seen to emerge as a compromise between sustaining present ways of doing and making an effort to act in ways appropriate to the current understanding of the problem.

At present it seems that the conflicts, which arise between other societal pressures and flooding, create difficulties in imagining ways forward. Barriers, associated with ingrained practices, arise for some proposed solutions when attempts are made at implementation, while others when put into practice do not appear to offer the new direction and long-term sustainable approach hoped for (i.e. building higher walls to account for climate change). In this extremely difficult context, those working in relation to these issues continue to muddle through in full awareness of the apparent contradictions in understanding and ways of doing.

It is posited that the issue of flooding arises as one that is seemingly characterised by insurmountable difficulties in finding ways of acting in a manner appropriate to the knowledge through which flooding is understood as a contemporary problem. Those working in relation to these issues make clear the complexities which combine to create a seemingly intractably difficult context. They reflect upon the nature of the situation and raise questions about how it is possible to create a truly sustainable way forward in this difficult context. The data extracts discussed in this chapter reveal the complex difficulties that arise in attempting to find sustainable ways of tackling

flooding. The shift to the risk management approach does not appear to resolve many of the complexities in tackling flooding highlighted in this chapter.

An increasing focus on risk calculation, including both probability (risk assessment) and consequences (cost-benefit analysis), to inform decisions has been noted as an integral part of the turn to risk management. This heightened focus appears to arise in response to the contemporary understanding of flooding. As such, risk calculation appears to represent an important part of the effort to find ways to address flooding in the contemporary context. It is necessary to highlight that 'risk calculation' refers to the definition as it appears in the policy discourse, referring to both the calculation of the probability of floods and the consequences of flooding calculated in terms costs (cost-benefit analysis is thus an important part of risk calculation). In this sense the next chapter examines 'risk calculation' as a basis for decision-making in light of the increasing emphasis given to it in the new risk management approach. The chapter entails discussion of the risk approaches to decision-making as they are formulated specifically in relation to flooding (e.g. analysis of the DEFRA flood points system is important in assessing the 'calculative risk approach' with regard to flooding).

These approaches to decision-making are assessed in terms of the extent to which they facilitate the kinds of difficult changes in regard to tackling flooding highlighted in this chapter. It is suggested that the hardships in enacting change against a backdrop of societal barriers (discussed in this chapter) are not resolved through an increased emphasis on risk calculation found in the new risk management approach. Rather, these act to further delay the pace of change. The conceptual literature and the empirical analysis together reveal difficulties that this kind of risk calculation creates in making changes. In the following chapter the empirical data is thus examined along side conceptual literature to distinguish the difficulties that an increasing focus on risk evidence for decision-making creates in implementing change. The extent to which the heightened emphasis on risk calculation (discussed in chapter five) in the policy approaches to flooding can act as part of the solution to flooding understood in the contemporary context is questioned.



## Chapter Seven

### The Risk Approach: Decision-Making and Risk Calculation

Suddenly they can't trust their river any more. It's like a loved one who has developed symptoms of psychosis. Anyone who has loved a river can tell you that the loss of river is a terrible, aching thing. But I'll be rapped on the knuckles if I continue in this vein. When we're discussing the Greater Common Good there's no place for sentiment. One must stick to facts. Forgive me for letting my heart wander. (Arundhati Roy 1999: 61)

#### **Introduction**

In the previous chapter a number of difficulties apparent in addressing flooding in the context of knowledge relating to land development, hard flood defences and climate change were discussed. This chapter gives specific attention to those narratives which delineate difficulties for change engendered through the requirement for risk calculation in decision-making. The data revealed several issues with regard to flooding relating broadly to the practice of risk-benefit and cost-benefit calculation for making decisions and achieving funding for flood management. Conceptual literature on risk also highlights assumptions underpinning risk assessment and the related practice of cost-benefit analysis that act to limit capacities to take decisions for a long-term future (Douglas and Wildavsky 1983; Adams 1995; Adam 1998). This is important with regard to decisions about flooding when it is understood in the context of climate change.

The chapter thus relates to the difficulties engendered by risk calculation, including cost-benefit analysis, when there are needs for change, created by the contemporary understanding and proposed solutions to the issue. An increasing risk focus, including calculation of both probability and consequences is an integral part of the new risk management policy on flooding. This approach arises as a response to the new challenges that the contemporary contextualisation of the problem presents. The

issues discussed here relate, in part, to economic considerations and as such it should be noted, that the author is not an economist. The following analysis takes an empirically grounded sociological look at some of the issues noted with regard to calculation by participants in the study, and by scholars in the conceptual sociological literature.

### **Calculating Costs and Benefits**

The constraints... obviously funding is one issue and that is an important sort of bottom line; we can't do something for nothing and there's always a tension with the provision of flood defence on how much money is being allocated to it. It is quite important in a way, in the work that you are doing, that you get your mind around that; the tensions in the provision of funding for flood defence. (Cons. Participant 1)

In this quote the participant highlights the significance of funding and the tensions that arise between funding and management of floods. For any flood management scheme to be implemented, or simply maintained, money is required. As such economic cost-benefit analysis forms a significant part of the decision-making processes with regard to flooding. O' Riordan (2002 cited in Ledoux 2004: 6) describes the various sources through which funds are distributed in relation to flooding. There are five noted sources; first, the Revenue Support Grant, this is issued by local governments from the Treasury, to pay levies to the Environment Agency, internal drainage boards, and for the discretionary spend faced by coastal authorities for specific coastal protection works. Secondly, the DEFRA supplementary credit approvals to cover non-grant aided works. Thirdly, drainage rates from land owners to drainage boards utilised to fund internal drainage board's expenditure. Fourthly, general drainage rates payable by farmers aimed at funding Environment Agency expenditure - for the Anglian Region only. Finally, and most significantly, DEFRA grant aid to the Environment Agency, local authorities and the National Assembly of Wales for flood warning systems, hard and soft defences and other infrastructure<sup>1</sup>.

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<sup>1</sup> DEFRA allocates funding in the spring of each year to operating authorities. It should be noted that the responsibility for delivery of flood management has now been allocated to the Environment Agency. The EA will also be made responsible for operating the national capital investment prioritization system across all operating authorities, approving the various authorities' capital improvement projects and distributing grants to them (DEFRA 2007c).

There is thus a centrally held budget for flooding (or related issues) that is distributed via the means described above. The various different processes through which funding can be allocated and flood defence plans implemented have been noted. However, the grant aid system is identified as providing ‘the bulk of the capital funding’ (Ledoux et al 2004: 7). The allocation of this funding for capital build and maintenance is achieved utilising a points system designed to assist in the allocation of funds when the requirements for potential projects exceed the national level of funding available (ibid.). Several of the participants raised the DEFRA priority scoring system as of importance in relation to decisions about flood risk and management. In this thesis the points system is considered to be an important part of decision-making in relation to tackling flooding in the UK. It is thus taken here as the key example for discussing the importance and the implications of cost-benefit analysis in relation to flooding.

The following discussion involves analysis of this aspect of the funding allocation along with the participant’s narratives relevant to this. The participants noted difficulties arising in efforts to include non-calculable aspects (such as social vulnerability) in decision-making, as well as highlighting conflicts between economic considerations and long-term environmental concerns with regard to flooding. The issues that emerge in acting for a long-term future within the constraints of cost-benefit assessment are highlighted in the conceptual literature. The conceptual and the empirical will be examined together to achieve insights into the processes of risk calculation which underpin decision-making with regard to flooding. It is asserted that cost-benefit analysis implicated in risk calculation can serve to make difficult changes required to address flooding in the contemporary context.

#### *Prioritising Funds across Flood Risks: The DEFRA Points System*

The Department for Environment, Food and Rural Affairs currently operate the points system, noted above, through which funding allocation, and thus the provision of flood management measures, is prioritised. The implementation of the particular formulation of this tool in decision-making represents a relatively recent phenomenon. At its most basic the allocation of grant aid funding from DEFRA is achieved through a prioritisation system built around three criteria: ‘economic, people

and environment'. A threshold priority score is set each year, which a proposed project must achieve in order to be eligible for grant aid.

There is an exception made for projects that are designed for the primary purpose of maintaining 'internationally designated sites'; these include Special Protection Areas (SPA), Special Areas of Conservation (SAC) and so forth. These are given consideration outside of the national prioritisation system because there is a legal obligation on both operating authorities and central government to undertake any works necessary to maintain these areas. These legal obligations are laid down in the 1994 Conservation Regulations for natural habitats. It is interesting that legal obligations impact in such a way, that the national prioritisation scoring system can not be applied. These laws thus act to place certain environmental conservation areas outside of the standardised systematic techniques for prioritisation. They are, therefore, legally imposed exceptions to a norm rather than being reflective of a wider change towards more sustainable approaches.

As noted, the three criteria DEFRA utilise for prioritisation of fund allocation for flood management are referred as 'economic, people and environment' (DEFRA 2006c: 6). In the analysis that follows each criterion will be outlined, as they feature in the DEFRA prioritisation system, and discussed in connection with the interview data and conceptual literature. First to be outlined is the 'economic' criterion. This is where cost-benefit analysis enters assessment. Cost-benefit analysis is utilised to determine which projects are allocated funding and thus which areas achieve government assistance for flood protection or management. In addition, it is used to decide the type of scheme that will subsequently be implemented i.e. to decide between various alternatives.<sup>2</sup> It will be asserted here that in some cases the requirement for cost-benefit calculation acts to limit capacities for change.

It is worth at this point, to interject some clarification of cost-benefit analysis as a methodology for aiding decisions. Jacobs (1991: 196) explains that 'cost-benefit analysis starts from a simple premise, namely that an investment project should only be undertaken if all its benefits outweigh its costs'. Given a number of different

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<sup>2</sup> It is in this second area, deciding between options, that the other qualitative decision criteria, people and environment are filtered into decision-making (DEFRA 2006c).

options for a project, the one for which the difference between benefits and costs is greatest should be chosen. He explains that costs and benefits can only be compared in this way if they are expressed in the same units; there is thus an attempt to place monetary values on them. Adam (1998: 72) further clarifies cost-benefit analysis; she writes 'at the simplest level cost benefit analysis is the comparison between costs and benefits of an action and/or its effects'. Adam explains that the proposed utility of cost-benefit analysis is that it allows rational decisions to be taken about which actions make economic sense and which do not. She highlights the use of the acronym BATNEEC which means 'best available technique not entailing excessive costs' (ibid.). This encompasses the notion of balancing the economic costs against benefits. However, other concerns besides pure economic ones can be included providing they can be quantified and given value in economic terms. There is thus a basic assumption relating to the capacity to give concerns important for decision-making economic value.

In the DEFRA points system costs and benefits are calculated in economic terms and this has resulted in the tendency to place greater emphasis on those things that can be economically valued<sup>3</sup>. This is evident in the DEFRA guidance on the prioritisation system wherein the economic element is summarised as follows;

This [*cost-benefit analysis*] covers the need for defences as represented by the economic risk (economic damage resulting from flooding or erosion multiplied by the probability of the events [*scientifically calculated utilising risk assessment*] causing the damage) compared with the whole life cost of providing the proposed defence. Only those benefits and costs that can be assigned monetary value are included in the benefit/cost ratio, although the guidance encourages a qualitative view of other impacts in the selection of project options. (DEFRA 2006c)

Here, it is possible to see the implied acknowledgement of the difficulties engendered in valuing only those things amenable to quantification. The encouragement of a 'qualitative view of other impacts in the selection of project options' is indicative of this concern. However, the capacity for those engaged in project proposals to include this 'qualitative' evaluation is limited by the necessity to pass an economic assessment. The inclusion of qualitative factors is made only in relation to the

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<sup>3</sup> For debates relating to economic valuation of the environment see Jacobs (1991)

selection of project options. Directly following the above quote this requirement is outlined;

The economic assessment is the *main* indicator of both the worthwhileness and urgency of a project because where there is a high probability of loss, either through natural event<sup>4</sup> or failure of an existing defence, this will have a major impact on the value of the damage avoided by the project. (DEFRA 2006c) (*My emphasis*)

This placing of the economic assessment as the primary indicator of ‘worthwhileness and urgency’ does not mean that qualitative assessment of the impacts of a given scheme cannot be taken into consideration. These are, however, always secondary considerations as they can only be taken into account *in addition* to the scheme passing the economic assessment. They thus do not constitute deciding factors in the way that economic factors do. The second part of this quote, where an explanation for this necessity is offered, brushes over the implicit assumptions whereby costs are deemed measurable in pounds – that only those costs with monetary worth are included in what is considered ‘damage’. The section on economics, contained within the description of DEFRA’s prioritisation system, finishes with the following quote that might be taken as indicative of the centrality of cost-benefit analysis calculated in monetary terms.

A fundamental principle is that the benefits of a project must at least equal its costs - projects for which this is not true will not be funded by DEFRA. (DEFRA 2006c)

This final extract from the DEFRA guidance on the priority scoring system reveals the centrality of economic assessment in decisions regarding flood management. The necessity for costs to be calculable in monetary terms is apparent. There are efforts being made to value non-quantifiable elements. However, this tends to occur through the attribution of economic values to such aspects. These processes of economic conversion have been critiqued by various authors.

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<sup>4</sup> Framing the issue in terms of climate change calls into question the very notion of what might be considered natural or otherwise - moreover the risk framing is indicative of decision-contingency which again pulls away from notions of naturalness in relation to floods and flooding. In this contemporary world the very foundations of this dichotomy as natural or not natural is called into question.



Both Douglas and Wildavsky (1983) and Adam (1998) posit problems with the utilisation of cost-benefit analysis in decision-making. They pose questions concerning capacities to compare aspects of value suggesting that these issues are not solved through converting all elements into economic values they are merely blocked from view. Adam (1998: 73) questions the processes of establishing costs and benefits. She asks; 'what if the benefit is priceless? What if the costs cannot be known due the vast time distancing of the processes involved?' She also raises the issue of establishing equivalencies between differing aspects of costs and benefits. How can the loss of ozone as a cost be equated with the cost of saving a rare species? The present solution to this difficulty in calculating costs and benefits for decision-making is solved by giving value to them through economic conversion. Adam asserts;

The credibility gap is pushed to its limits when we are asked to believe that the unitary framework of putting equivalent prices on all of these costs and benefits may be difficult but not impossible, that it is merely a question of time and research funding before the resource, nature, is going to be financially mapped in its entirety. (Adam 1998: 73)

Douglas and Wildavsky (1983) provide similar critiques in relation to cost-benefit analysis. They identify two key assumptions that underpin such analyses; 'the major premise that economic markets are appropriate measures of what is valuable and the minor premise that no resource has intrinsic merit but that the mixture of resources is best that maximises some objective' (Douglas and Wildavsky 1983: 70). They assert that these assumptions mean that the question of comparability among valued objects does not come up because 'it is supposed to have been solved by converting to the common denominator of economic value' (ibid.). In a similar line of reasoning to Adam (1998) they also question the extent to which comparability of valued phenomena can be alleviated through economic conversion. They ask:

Who can equate the preservation of the snail darter with the job of a Mississippi farm labourer, or the danger of eating too much salt with jogging injuries or with nuclear meltdown? (Douglas and Wildavsky 1983: 70)

A question to which most would answer that no-one can reasonably equate such diverse things with one another; the economist, however, would answer otherwise. They thus contend that the techniques employed in cost-benefit analysis tend to give

undue prominence to values that can be calculated, not necessarily to the most significant. In the case of flooding, economic costs and benefits are calculable and therefore, tend to receive more attention than other costs, such as health, environmental and psychological or emotional losses. In regard to decisions relating to flood defence they are taken on the basis of economic viability of construction or maintenance. This means that areas like London will always get defences where other areas, such as parts of Essex and Norfolk will not (DEFRA 2006d). Basing the decision on economic value allows the issues such decisions present in terms of social injustice not to be seen. The economic decision is a purportedly an objective one where the distinctions between which people are protected and which are not is unimportant.

In this kind of assessment gaps thus appear through which things fall that have intrinsic value to most people but no calculable monetary value. These difficulties are increasingly recognised by those who work in addressing issues with flooding. However, attempts to address these critiques appear not to be levelled at the methodology itself but rather at ways of making apparently unquantifiable aspects quantifiable. The focus then, falls upon research as a means for resolving problems that arise from the propensity to valuing calculable costs. This means that it is not the methodological approach to decision-making that is questioned, but rather it is the aspects of value that are not easily calculable, if at all, which are considered problematic.

Participants in the study further highlighted the significance of economic cost-benefit analysis for decision-making. Below is an example of one such narrative wherein the interlocutor discusses the use of multi-criteria analysis but points to the significance of economic costs in justifying expenditure.

You've got sort of social, environmental, engineering cost and you've got different issues and in different proportions so you've actually got to try to balance those out. Lots of things have got to be compared for if you like the *overall best solution*... but in whose opinion? If you're a fisherman you've got one view, if you're a boatman you've got another. And so when you look at multi criteria analysis you've actually got to think about how you weight the different issues and who is actually going to be doing it. So it gives you a way of qualitatively comparing one scheme with another in terms of the options within the scheme. *But you've actually got*

*to go for a benefit/cost analysis to satisfy DEFRA and the treasury in particular in terms of justifying expenditure for a particular scheme. It helps you sort of knock out some of the options on the way um... but it doesn't help you make the final decision. (Eng. participant 17) (My emphasis)*

The interlocutor explains that there are limitations placed on the capacity to take relevant issues outside of economics into account because of the necessity to 'justify expenditure' for any particular scheme to be funded through centrally allocated government funds. To justify a project proposal there is a requirement to demonstrate the creation of a pure economic gain (or at least of no loss) before other benefits, quantified or otherwise, are taken into account. It is worth noting that implicit in this participant's interpretation of the situation with regards to decision-making is the inference that qualitative analysis involves 'opinion' or value judgements where economic analysis does not. Douglas and Wildavsky (1983) demonstrate, however, that there are value judgements inherent in economic analysis i.e. the propensity to value calculable factors over non-calculable and the valuing of the present over the future.

Adam (1998) explains that in economic terms the future is given less value than the present. This is in large part due to the practice of economic discounting. Adam (1998: 74) delineates the rationale behind the practice of economic discounting, utilising a monetary example which is taken up here. It is assumed in economic discounting that given the choice a person would prefer £1000 in their hands today rather than in 10 years' time. The reasons for this are multiple; first, this money could be invested now and would therefore be worth much more in 10 years than £1000. Secondly, as incomes tend to rise over time, the person is likely to be earning more money by then, making the sum proportionally smaller. Finally, people do not know about their future need; they may even be dead 10 years from now.

The implication of this is that economists discount the value of a future sum of money backward towards the present. Adam (1998: 73) explains that this means by today's value and at a discount rate of 10 per cent per annum over a period of 10 years, the future £1000 is calculated to be worth a mere £386 today.' The effect, Adam asserts, is that in economic valuation the future is devalued. Adam suggests that this way of conceiving the future means that it is less important than the present because it has

less economic value than the present. She highlights how the further into the future this reasoning is extended the more worthless the future domain becomes. Adam explains; 'as the devaluation of the future increases with temporal distance - £1,000,000 of a hundred years hence is calculated to be worth a mere £75 today: a few more years and it is worth nothing.' The assumption underpinning all of this is economic growth. The imperative from this perspective is to maintain economic growth, as long as this is maintained the future is secure.

Douglas and Wildavsky (1983) refer to this same implication in relation to cost benefit analysis. Costs, they point out are incurred immediately, while benefits are felt much later. This raises the question of how future benefits are valued; the answer, they are valued at today's rates. Thus, in the calculation of costs and benefits the present always takes priority over the future. Douglas and Wildavsky (*ibid.*) point out that valuing the present over the future can be considered to be nothing other than a social judgement. They assert that if technical grounds are used as the basis for deciding whether to accept current interest rates charged to industry or a different social discount rate 'the moral ingredients in the decision have been masked' (Douglas and Wildavsky 1983: 70). That is to say, the moral decision to value the present over the future is removed from view as attention is diverted to the technical decisions around the choice of discounting rate.

Adams (1995) further explains the definition most commonly found of risk is 'the probability... multiplied by the magnitude' and because risk is about what happens in the future the outcome is discounted to its present value. Adams (1995: 94) explains 'the present value of some future loss is the economist estimate of the sum that would have to be invested now at the going rate of interest in order to produce a sum of money equal to that loss in the year in which it occurs'. This is an economic means utilised to make the incalculable (namely the future) calculable. As noted this has the perhaps undesirable effect (in terms of addressing environmental issues) of making benefits and costs in the present more important than benefits and costs in the long-term. It thus entails a tendency to value the present over the future. It involves a focus on economic growth and provides a future that is the best in economic but maybe not in other terms. The assumption is that economic growth will solve all other problems; that it is the best way of ensuring the best life for the greatest number of people.

The significance of cost-benefit analysis in relation to decisions about flood management has already been seen. The act of economic discounting built into these assessments can be seen as a facet through which taking decisions for the long-term is hindered by ways of doing inherent in the present way of life. This means that it is the present value of any option which determines its worth. This assumption in decision-making creates difficulty in valuing the benefits of those flood management options which may have greater benefits for the long-term. Long-term benefits are not taken into account as the further into the future the benefits arise the less they are worth in monetary terms; the same applies to costs. Thus the costs of today's actions are deferred to the future, while the benefits are optimised now. From the economic point of view benefits which would only be felt in the future are not as valuable as benefits in the present. This is built into economic reasoning and the processes of evaluating costs and benefits. All this means that even if it were possible to make all costs and benefits calculable the act of discounting still results in a preference for options that have lower costs and greater benefits *in the present*, rather than choices that have greater long-term benefits against higher costs now.

There are efforts evident in the DEFRA priority scoring system to include consideration of other aspects outside of the cost-benefit calculation, which could be a means of overcoming these issues identified in relation to a cost-benefit calculation for decision-making. The 'environment' and people criterion, noted earlier, are given consideration qualitatively and are included in decision-making separately from the 'economic'. These elements of the scoring system thus fall outside of the cost-benefit analysis.

A score for environmental benefits is included to give greater priority to those projects 'that are expected to provide additional benefits for the natural environment' (DEFRA 2006c). The government has a commitment to the promotion of biodiversity under the 'Biodiversity Action Plan'. This involves a commitment to increasing habitats such as grazing marsh, reed bed and salt marshes that can 'be created through appropriate flood and coastal management projects' (ibid.) The environment score is included with the intention of assisting the attainment of the target that 'all projects should, at least, maintain the status quo in habitat terms and should, where possible

provide environmental enhancement' (ibid.). Additional priority is thus given to those proposals where national environmental policy is supported and Biodiversity Action Plan targets are addressed in addition to the *primary* flood defence function.

This does not, however, necessarily result in environmentally sustainable options being implemented in favour of more ecologically disruptive approaches. It is only when the proposed action has passed a cost-benefit analysis *and* provides an environmental benefit that it may be given priority. As noted previously an economic cost-benefit analysis is required to 'satisfy DEFRA and the treasury' (Eng. Participants 17). The participant cited below explains the primacy of cost-benefit analysis in calculations for decision making.

We look at lots of different things and lots of different ways to combat the problem and then apply the economics and see which, you know, 9 times out of 10 it can be lots of things but something that would cost you ten million pounds has no advantage over the two million pound option even if it is the greenest thing that you have ever seen. (Pol. Participant 13)

This participant describes the significance of having to pass a cost benefit analysis. It is the economic benefits of any scheme against the economic costs which constitute the deciding factor, with benefits such as environmental ones, not comprising a justification for greater expenditure. This means that the deciding factors are always cost and risk reduction, meaning that the cheaper option which achieves the greatest reduction in risk will be favoured and this will not necessarily be the option which represents the best choice environmentally or for the long-term. It is only in a context where the costs and risk reduction benefits are equal that an option with greater environmental benefit would be chosen.

In discussing the processes of taking into account the long-term future in implementing and maintaining flood management schemes the participant emphasised the necessity to pass a cost benefit analysis. They explained that any provisions made for acting in a manner that takes into consideration the long-term can only be made within the constraints of balancing costs and benefits.

you get to a point where I don't know say you were spending 2 million pounds on a scheme and that just about gets a cost benefit ratio that's still

beneficial by going up to 2.5 million pounds might take it underneath the bar. (Pol. Participant 13)

It is apparent that economic cost-benefit analysis remains the dominant base on which decisions with regard to flooding are taken. The conceptual literature teaches that the way these economic costs and benefits are determined involves a built in tendency to value the present over the long-term. This means that those options that may have greater economic costs in the present but represent a better long-term option for social, environmental, and economic sustainability are not valued. There are thus implications with regard to this necessity for cost-benefit assessment for shifting actions to align with the present understanding of flooding. It is posited that the DEFRA points system, even with the efforts to qualitatively include environmental and social aspects, does not create an adequate space for change. The changes implicated in the contemporary understanding are hindered by the mechanisms currently in place for decision-making. With regard to the literature, discussed earlier in the chapter, certain assumptions that underpin cost-benefit analyses are noted as creating difficulties in change.

There are also noted difficulties in the inclusion of considerations encapsulated in the 'people' score. The criterion referred to as 'people' is now the subject of analysis. 'The people score', it is explained, 'recognises that there are often impacts on those living in risk areas that are not reflected in the economic assessment' (DEFRA 2006c). It is recommended that these be taken into account in a qualitative manner. This is seen as only achievable through taking 'a simplified standard approach for prioritisation purposes' (ibid.). This simplified standard approach, which is included in the decision-making, operates in the following way:

The number of residential properties is utilised to calculate the population which have their risk of flooding (or loss through erosion) significantly reduced by the proposed project. This number is often obtained from large scale maps or geographical databases of addresses. An adjustment is made to exclude those 'effectively outside the risk area'; for example, properties on the upper level of blocks of flats (DEFRA 2006c). The 'base people score' is calculated by multiplying the number of residential properties per pound of the project costs by a standard adjustment factor (ibid.). The

implicit assumption in these calculations is that there is an average occupancy of the houses<sup>5</sup>. The way that the 'base people score' is calculated also carries an emphasis on the *number* of people affected by a flooding event as opposed to the frequency of flooding events. Areas that are regularly flooded but are not highly populated are thus given a lower priority than those areas that are highly populated but not necessarily regularly flooded.

The degree of social vulnerability of the people in the area at risk is also factored in to the 'base people score'. In the DEFRA guidance some 'key population' characteristics are identified as indicating a higher level of vulnerability to flooding events. They offer examples of these characteristics;

The elderly (typically over the age of 75) have a higher incidence of disabilities, including arthritis, making them less able to prepare for and recover from a [flooding] event.

Single parent households have less time resource available to them for preparation and recovery.

The less affluent have fewer financial resources for recovery from an event, and are thought less likely to have access to help.

(DEFRA 2006c)

The example above demonstrates the kind of social vulnerability that DEFRA are aiming to consider under the 'people' criterion in their processes for decision-making. DEFRA (2006c) highlight that the inclusion of social vulnerability in decision making procedures is difficult. Defining what might be considered as social vulnerability and finding a means of identifying such people, are noted as factors in exacerbating the difficulty involved in such tasks. They state 'data for assessing these factors are not easily available and there is currently no agreed means of combining them into a realistic measure of vulnerability' (DEFRA 2006c). This acknowledgement of complexity, however, is not reflected in the methodology utilised. The 'scale of economic deprivation' (DEFRA 2006c) is invoked for measuring vulnerability. This scale ranks electoral wards based on an assessment of a mix of economic indicators. DEFRA state, in connection with this methodology;

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<sup>5</sup> This would put those that live in households with more people than the average number at a disadvantage; given that those households likely to be above average in terms of occupancy number are also likely to be the more deprived or vulnerable this assumption carries some problems with it.



Whilst the measure is not fully researched for the proposed use, and the terminology is rather emotive, the data is easily accessible via the internet. It is considered to provide a reasonable indication of the likely location of the above groups for whom higher funding priority is justified on the basis of increased vulnerability exacerbated by lower economic resources. (DEFRA 2006c)

It is undoubtedly difficult to measure vulnerability; indeed deciding what constitutes vulnerability is not an easy task. However, applying this standardised approach to the measurement of vulnerability by electoral wards does result in situations where those vulnerable people are overlooked. In the narrative given here by one of the participants in the study it is possible to see an example of a situation wherein this approach to taking vulnerability into account encounters difficulty.

I'll give you an example; in Wessex, an area that floods very frequently, the people that do flood are low income houses, sort of a row of terraced houses, but they actually get their points [vulnerability points] from the [electoral] ward record. Now the ward records are a very broad brush approach and so everybody in that ward contributes to the people's social status. So up the hill there are people with double incomes, with very large double incomes and lots of very big cars and they actually contribute to those people's points. So this particular area scored a minus 1 and I felt that was unfair. I would rather that they knocked the door of those concerned and said; have you got a granny living with you on a Zimmer frame? Have you got a disabled husband? And actually give people scores out of that, rather than going to a broad brush approach. (In.Org Participant 10)

In this narrative the interlocutor relays how the present 'broad brush' approach employed to account for vulnerability in decisions relating to flood management can result in vulnerability being overlooked. It is posited here that this relates to a wider point regarding the application of broad scale methodologies to make decisions. General nationally standardised methods can help to ensure consistency; however they also act to detract from the ability for people with local knowledge to act upon their own discretion. In the example described above an individual drafting a proposal for DEFRA grant aid could be able to provide a better picture of the vulnerability of any given area drawing upon their local knowledge and perhaps a qualitative assessment. This kind of knowledge could not be included in the decision-making procedure through the current assessment process.

The vulnerability index, associated with the 'people' criterion, is the measure by which the points in the DEFRA prioritisation scheme are allocated. Thus, discretion of operating authorities to assess vulnerability is limited by the necessity to utilise this standard approach imposed by DEFRA. The difficulty, however, is that this approach facilitates the aim of including vulnerability in a nationally applied and consistent way. This can be seen as important in attempting to ensure even treatment of vulnerable individuals. Conversely, this kind of structured, imposed methodology to inform decision-making entails limitations in hindering the very end originally identified - in this case to take account of vulnerability in decision-making - as some vulnerable individuals fail to benefit from these attempts to incorporate their vulnerable position in decision-making. Here, it is suggested that greater room for the inclusion of additional qualitative local assessment may assist in countering some of the difficulties engendered by utilising the standardised approach. Time it would seem may be a key factor in hindering this kind of dual approach to assessment of vulnerability for inclusion in decision-making.

Additionally, the need for national comparison in applications for projects means a standardised qualitative assessment would be necessary - applied in the same way in every project proposal - this in essence would potentially defeat the object. An interesting point for departure in further research would be to investigate the extent to which discretion is a possibility in both the writing and approval of proposals. Moreover, what would the role of power and networked relationships be if there were greater room for discretion? The issues discussed above, in relation to standardised approaches, can be seen as creating the problems as ones of measurement for better decision-making, distracting the eye from the deeper roots of the problems.

The issues which arise from the tendency to value calculable aspects with regard to costs and benefits, have been asserted as problematic in relation to tackling socio-environmental issues which require a long-term vision and the capacities to take into account elements not amenable to economic calculation. In relation to flooding the attempts to address issues with cost-benefit analysis are made through the qualitative inclusion of the two other categories in the DEFRA priority scoring system; environment and people. It is asserted, however, that this does not solve the issues associated with cost-benefit analysis in decision-making as the economic still takes

precedence. The capacities required to enact changes to align approaches to flooding with the contemporary understanding are posited as constrained, rather than furthered, by an increasing emphasis on risk calculation in decision-making.

It is asserted that despite efforts to include consideration of benefits which are not easily calculable those economic costs that are more easily quantified and calculated take priority. The reasons for this relate not only to the greater ease with which economic costing can be calculated but to the imperative to evidence an economic return for monies invested in flood management. The requirement for expenditure needs to be justified in terms of the return which the proposed scheme will provide in limiting possible (or probable) economic damage. The emphasis is thus upon securing a sustainable economic future which it has been suggested creates a tendency towards sustaining present ways of doing and thus acts as barrier to change.

The over-riding emphasis upon economics with regard to the prioritisation and selection of flood schemes has been asserted. The implications of the emphasis on calculable aspects have been highlighted specifically in relation to flooding. It is evident that despite efforts to consider elements in decision-making that are not readily amenable to calculation - such as vulnerability - there remain difficulties in this which relate to the application of standardised procedures more generally. In addition, it is suggested that social and environmental benefits no matter how significant do not justify greater expenditure in the way that economic costs saved do.

The efforts within the DEFRA point scoring system to accommodate consideration of non-economic aspects can be seen as part of a more general shift to consider ways of achieving inclusion of other non-calculable aspects. In more recent times the notion of multi-criteria analysis has been given some attention as a potential means for informing flood management decisions. The participants, however, highlighted the continuing significance of economic assessments in decisions about flood risk management. The reasons have been depicted by participants in the study as relating to the balance between funding provision and economic return. The wider context in which decisions about flooding are taken is important in this respect. Decisions about funding allocation with regard to flooding do not occur in a vacuum but in the context of attempting to maintain an economically prosperous state for the present and

distributing funds to address a multitude of contemporary issues. In the following section decisions with regard to managing flooding are positioned in the wider context of political decision-making and allocation of funding.

### **Decision-Making: The Wider Context**

The assertions put forward thus far have examined flooding as an isolated concern. Many of the difficulties in exacting change are however related to the wider context in which decisions about flooding must be taken. As noted, an important facet of grappling with flooding in the contemporary age is related to the necessity for money in order to implement possible changes. The treasury is a key source of funding for tackling social issues, such as flooding. The imperative to secure funding for flood management in any form occurs in a wider context of other social issues. This wider context, it is posited, creates change as a greater difficulty since the issues and obstacles discussed above cannot be removed easily. Taking into consideration factors other than the economic has already been asserted as a difficulty in taking decisions where changes in current ways of doing are required. Now it is suggested that there are significant difficulties in resolving these issues as the requirement for economic cost-benefit analysis arises in a wider context of justifying expenditure on public issues.

Social concerns beyond the environmental do not necessarily involve the same difficulties that arise in the context of flooding. For other issues fundamental features of the contemporary way of life are not implicated in their cause and as such any required changes can be met with political or institutional reform. Flooding as an issue must be comparable with and be able to compete for funding within the constraints to which all other domestic and international problems adhere. The role of treasury in influencing decision-making can be seen as related to the increasing emphasis on evidence. The participant cited below notes the significance of economic justification for funding flood management in the wider context of comparison with other areas of social concern. This participant is demarcated as an 'engineer' in the analysis here. They explain that economic assessment is required - in contrast to other forms of analysis for decision-making - in order to justify expenditure on flooding over and above other issues which also require investment.

It [*multi-criteria analysis*] does not help you justify to the treasury that expenditure has got to be made on flood defence as opposed to hospitals, schools, or roads. You have internal decisions within the project, how do I manage flood risk? Do I spend money on warnings, walls, barriers, what do I do? And then as a country we've got to decide do we spend money on that or addressing accidents on roads? (Eng. Participant 17)

This participant highlights the importance of risk-benefit and cost-benefit analysis for justifying expenditure on flooding when situated in comparison with other issues. The risks of flooding as well as the consequences of it, should it happen, need to be calculated in a way that makes it comparable with other issues. This requirement is necessary in order to justify expenditure on that particular issue as part of a wider set of social problems. This has been delineated as problematic as there are inherent difficulties in drawing comparisons. As noted, these problems are overcome through recourse to economic conversion. Adam (1998) and Douglas and Wildavsky (1983) have been critical of this approach to ensuring comparability asserting that converting all valued phenomena to economic values does not solve the problems inherent in comparability, rather it diverts attention to finding ways attributing economic values. This serves to distract from the problems associated with attempting to compare costs and benefits and limits capacities to value factors that are not easily calculable and resulting in bias towards calculable aspects.

The driving force behind such needs for comparability in decision-making relates intrinsically to the need for funding to act upon any issue. Economic calculation thus appears as the logical means through which different problems and their solutions are given value, since the decisions to be taken have come to be related to funding, rather than directly to the problems themselves. Despite the various difficulties that are associated with economic conversion, this approach to decision-making remains in place precisely because economic return can be seen as highly significant in industrial capitalist societies. There are further difficulties with regard to flooding within this wider context of political decision-making.

This emphasis on economic competition for funding in the context of other social issues is noted as problematic for an issue like flooding for two primary reasons. First, the government has no statutory requirement to protect from floods. Secondly, it has

been proposed that there is a political tendency to prioritise the short-term over the long-term and that this creates difficulty for addressing flooding with the strategic long-term vision that the climate change framing appears to require. In this respect it is suggested that the necessity to justify expenditure for treasury is an important facet in limiting change and in sustaining past and present ways of doing. The participants discussed this difficulty in political decision-making about funding. When asked whether they thought the treasury might view things more in terms of short-term economic priorities, the interviewee cited below replied as follows.

Absolutely, first of all the amount of money that they have to spend is determined by what the tax take is etc and are there particular demands coming from the benefits budget or whatever it might be to manage things across the economic cycle like that. (Ins. Participant 9)

The participant notes the propensity for political funding allocation to be prioritised for the short-term. In relation to this example, economic considerations (focused on the short term) are not compatible with the long-term view that it is suggested needs to be adopted with regard to flooding, as it comes to be framed as a climate change impact. A number of participants depicted the difficulties associated with a short-term political focus as being ones of keeping flooding on the agenda. The focus is thus not upon the inherent difficulties associated with the political-economic factors that lead to a short-term focus, but upon the nature of flooding as an issue not fitting with prescribed ways of doing. That is, the only way it remains on the political agenda is if the problem causes economic damage and the resulting political pressure arises. Thus, floods are only significant as long as they are occurring regularly. This is not compatible with the kind of long-term thinking that is required to cope with flooding in the contemporary context. The participant below again highlights funding as a key issue with regard to floods and explains the difficulties that the short-term political focus raises.

I guess funds probably, as I say as the emphasis shifts and the funds drift elsewhere, you know every body has got problems the health service has got problems, education has got problems everybody needs money it's who shouts the loudest. If we get flood events every year now for the next ten years then it will stay relatively high profile but if they drift away and things change then we could find ourselves in a similar situation in ten or twenty years time where we have not really done enough. It's maintaining

the current interest really, that's what everybody needs to do... (Pol. Participant 13)

The participant characterises the problem as being one of 'retaining the current interest'. This can be seen as example of the focus being upon coping within the constraints of the current system, despite the roots of the issue being located within the system itself. The necessity for the calculation of costs and benefits in economic terms is tied to the importance of money for capitalist societies. This creates some of the roots of the difficulties as seemingly insurmountable, since practices integral to the industrial way of life are implicated in their causes. The necessity for economic arguments for treasury and the difficulties that this presents for change is also highlighted by the participant below, described as an academic. In this extract the participant highlights the issues in moving towards more innovative approaches that work with natural processes with regard to flooding. They refer to the requirement to justify any change in approach with 'strong economic arguments'.

But this move towards management is going to cause a lot of problems, not least with the treasury because all they'll say is "give us strong economic arguments". (Acad. Participant 11)

This participant highlights the difficulties in changing approach to flooding, indicating that the necessity to provide economic arguments for treasury may act as a barrier in this respect. This is indicative of the roots of requirements for evidence and calculated economic benefits as lying with treasury. The conceptualisation of flooding as a climate change impact creates it as a long-term issue to which new approaches are required. These new approaches are difficult to conceive, let alone achieve, in a situation characterised by a historical legacy of development and defence, to which the escalation of the contemporary issue can be, in part, attributed. These problems in conceiving of different ways of doing are compounded by the requirements for economic calculation and justification to secure funding. This economic imperative in the decision-making cycle is held here to limit capacities for change.

It should be noted that these impediments make change difficult but not impossible. They do however act to deter actors from implementing changes in approach to such issues. In this situation it thus appears to take particularly motivated individuals to

take a 'special interest' and give active dedication in order to create room for shifts in ways of doing and living. They are working always against the established and ingrained ways of doing to exact change. This notion is evident in the data.

It is very much down to the people at the moment. It's finding the like minded person in each of the organisations to actually want to make a difference and want to change things and if you've got that then it's a winning combination.... its gradually bringing people round to your way of thinking as well and then getting people actually doing things over and above what they would consider to be their normal day job which is where we are at the moment because it is not part of their day jobs and that is what the change is that needs to be made really. (Pol. Participant 13)

This participant highlights the role of people who 'want to make a difference and want to change things' in the quest for shifts of ways in acting. Institutions within which people work have ingrained practices which individuals must work against or around in order to create changes considered important at the present time. Implementing change in this difficult context thus requires people to work against and outside of current arrangements. In this treatise this situation is viewed as a significant difficulty in enacting changes and finding news ways of working beyond current practices.

### **Calculating Risk Reduction**

In emphasising the significance of risk calculation for decision-making, there is a necessity to demonstrate the level of risk reduction achieved by implementing any particular scheme. This relies on past-based evidence which is more difficult to obtain for innovative, newer solutions than for already proven ways of doing. It is suggested that the necessity for calculation as a basic principle for decision-making acts as barrier to change i.e. calculation as a precursor to decision-making appears to stifle new approaches. The benefits of any given scheme are calculated as a reduction in the probability of losses (losses calculated in economic cost-benefit terms). This kind of assessment is dependent upon the calculability of risk and thus upon knowledge of the past. Risk assessment involves projecting into the future through the utilisation of information from a known past; i.e. the empirical basis for risk assessment is past and present data. In relation to assessing the benefits of any proposed scheme it is necessary to demonstrate that the selected option will reduce the risk and thus reduce



the likelihood of the area being flooded and economic losses being incurred. This evidence is required to prove that the proposed action will reduce the likelihood of incurring the costs that would be felt should the area flood.

That is to say, in regard to the utilisation of risk calculation for decision-making it always imperative that a decision or action, in this case to implement a flood defence or a particular kind of flood defence, be justified through providing evidence that the action will prevent or reduce the likelihood of costs being incurred. This necessity for calculable evidence in this respect has been noted by the participants as a difficulty in implementing more novel approaches to the tackling flooding (e.g. restoring flood plains to provide greater capacity for flood waters). Despite knowledge relating to those natural processes which provide flood defence it appears that difficulty is encountered in evidencing the effects that restoration of natural processes, or implementation of processes that work which natural processes have. This in part relates to the necessity for past and present *data* to provide the kind evidence that is required. The underlying emphasis on calculation and evidence rather than assertion can hinder the implementation of changes in ways of tackling issues. This can be seen as a barrier to taking up and acting upon knowledge.

The necessity for calculation means those options which are established and thus for which there is significant past data, can be demonstrated more easily as favourable options. This reliance on past data and evidence, necessary for risk calculation, is thus noted as a barrier to change. It acts to favour that which is already established rather than furthering innovation. The participant cited below is classified in this thesis as an actor with a role in relation to insurance and flooding. They describe some of the difficulties discussed above, which in this thesis are seen to relate to the dependency upon past calculation for decisions about the future. This is a rather lengthy piece of narrative and will thus be interspersed with relevant discussion of the extracts and relevant examples of other narrative pieces that are indicative of the points being made. Preceding this extract the conversation has related to the implementation of more sustainable solutions for flooding.

For us the bit that we want more information on is; so what is the effect of that on flood risk within the catchment? You build a wall and you know

what defence standard it is offering, you provide an extra x million cubic metres of flood storage up stream and no-body can yet say to us and so that will mean that flood risk here has been reduced by x probability. (Ins. Participant 9)

The participant refers to the necessity from an insurance perspective to know through calculation what the consequences on risk are for techniques for flood relief. This interlocutor highlights the greater ease with which conventional approaches (sometimes described holding the line) i.e. building a wall to stop flooding can be calculated. This is in part because of the historical use of such approaches for flood prevention or management and the subsequent high level of data and evidence available with regard to these approaches. The participant explains this is not the case for notions such as improving more natural capacities for areas to flood. These kinds of approaches, advocated as more sustainable ways of approaching flooding in the contemporary context of increasing development and climate change, can thus be hindered in their implementation because of the difficulties in calculation and providing evidence. For this evidence to be achieved it may take significant time and thus delays shifting to ways of acting deemed more sustainable. Time is significant in this respect and the short time scales available for establishing and proposing schemes has been noted by participants as a further barrier to implementing changes in approach. An example of these types of observation is provided below; this is taken from a participants classified as an engineer.

One of the problems always has been that we don't have enough time sometimes to get the most sustainable solutions. Often the simplest solutions to build are the simpler ones to design and do quickly, so it is a plea for more time allocated to planning the sustainable solutions and then you are likely sometimes to get a cheaper long-term solution. (Eng. Participant 1)

In this narrative the time pressure for design and implementation of approaches for tackling flooding is highlighted as a barrier to innovation and establishing more sustainable approaches, which may be cheaper for the long-term. Previously established ways of doing are thus once again favoured in this respect as they require less time for design and implementation. In addition, the evidence for approaches such as flood walls is readily available making the calculation easier and quicker to achieve. These time constraints and their role in limiting change can be understood in

terms of the way that time is treated in work settings in contemporary capitalist societies, that is as money.

Adam (1998: 65) notes that 'time = money is a presupposition that permeates industrial culture'. She explains that 'as money, time is irreducibly tied to work and economic exchange. Once it is quantified and used as exchange value, time becomes an economic variable like labour, capital and machinery, a commodity that has to be handled economically' (ibid.). This conception of time as money can thus be seen as implicated in the difficulties in achieving more time for design, development and implementation of more novel, innovative approaches to flooding. The more sustainable solutions, which are likely to be cheaper in the long-term, and can be seen as a response to changing knowledge and understanding, are hindered by the time constraints on project development. These constrictions can be seen as tied to the links between time and money integral to industrial capitalist culture.

The participant below, cited earlier in this section, offers their explanation of the difficulties inherent in evidencing newer approaches. They refer to the knowledge that is held in relation to the difficulties in sustaining hard engineering approaches and manipulating natural systems, and note the apparent barriers faced in acting upon such knowledge. For this participant the difficulty is framed as a lack of quantified evidence for demonstrating the benefits of different approaches that take into account this present understanding of flooding. The focus upon calculation and (past-based) evidence is positioned as delaying and hindering change.

Interviewer: Is that perhaps because we have not used these new flood relief techniques in the past?

Participant: I think that it is... and you know it's talked about in North America or whatever but actually it's very difficult to find any properly quantified research there. We know the Dutch are looking at similar techniques so it's, you know, all around the world different people are saying actually the problem is that we're trying to turn rivers into canals and natural systems do not react very well to that sort of treatment but nobody has quite got that far enough down the process to be able to say and by doing this you have this effect. (Ins. Participant 9)

The interlocutor explains that across the world a problem has been identified with the human manipulation of natural systems, they use the example of re-directing rivers but the construction of flood barriers serves as a similar example. For this participant

this knowledge is, however, limited in the effect it has upon ways of doing because of the necessity for evidence to prove how different ways of acting - i.e. utilising natural processes for flood defence more - reduce risk. This focus upon calculation and evidence coupled with considerations regarding time and money is held here to limit capacities for change and ingrain past ways of doing. These limits to change are posited as problematic in an age characterised by an apparently urgent need for shifting practices away from what has gone before. The focus on risk calculation for decision-making is posited as resulting in an inadvertent bias towards maintenance of *what is*. The participant cited above continues in their narrative to suggest that it is not possible to act on contemporary knowledge(s) of the problem because there is not sufficient evidence that different ways of doing will reduce the risk for a given area.

We need to know that the impact of doing this in the Slopshire valley is that flood risk in Puddleby is now reduced to this and then they can do all their pricing calculations based on that and it would change the flood outline and all of those things. (Ins. Participant 9)

Again the interviewee highlights the necessity for calculation of risk reduction, making the link between these calculations and cost-benefit assessments. It is necessary to be able to evidence the effect that a scheme will have in risk reduction not just in its own terms but so that the averted costs can be calculated. This necessity is thus integral to schemes passing a cost-benefit analysis. This same participant continues in the final section of this particular exchange highlighting new approaches as important for tackling flooding in the context of climate change. Interestingly the participant describes the implementation of different strategies – as opposed to the past strategies of hard flood defence – as ‘blue skies thinking’. Here climate change is positioned as a future issue and the changes to practices deemed necessary for, in this case adapting to climate change, as something to get ‘in position to do’, significantly through research and calculation.

Interviewer: What do you think the government view on this issue is?

Participant: I think they're quite open to the idea, it just is a jolly sticky problem to sort out as yet, but I think it is the direction we will need to be going in. If you like it is a bit more blue skies thinking than some of the other things that are very much about the here and now. That is the way with climate change we will need to go and we need to start doing the work now so that we are in a position to do it but it is not quite doable right now. (Ins. Participant 9)

This exchange is indicative of the focus on calculation and evidence which is given increasing emphasis for decision-making in the new risk management approach. Knowledge of the problems with present ways of doing is thus not enough to spur changes in actions, rather each change, each scheme must be calculated in terms of the effect on risk reduction and thus the cost aversion it will have. As there are difficulties that arise in the provision of this kind of evidence for novel approaches the implementation of different ways of doing is hindered and, moreover, current practices continue. This continuation of current practices serves to further ingrain past and present approaches and limit innovation.

In relation to new solutions the focus upon past data sets and achieving empirical proof prior to change creates difficulty. Since past data sets obviously prove more illusive for new and innovative ways of doing that fall outside of past and present practices this acts as a constraint on change. The emphasis on evidence and calculation, in this respect, serves to make more difficult the kinds of shifts in ways of living demanded by the contemporary understanding of the problem. The capacities for change are thus highly constrained in societies so heavily reliant (and apparently increasingly so) upon the pulls of past calculation and empirical proof for decision-making. In the final chapter of the thesis these issues will be discussed with reference to the sociological risk and time literature. The work of Beck (1992a), Luhmann (1993) and Adam and Groves (2007) will be drawn upon to better understand the reliance on risk calculation for decision-making and thus the apparent increasing prevalence of an emphasis upon risk with regard to flooding as a response to the contemporary context.

### **Concluding Remarks**

The assertions in this chapter relate to the increasing emphasis on risk calculation in the new policy approach. Through examining conceptual literature and the empirical data together the practice of risk calculation (including both probability and consequences) for decision-making is revealed as protracting change. Probabilistic risk assessment and the related practice cost-benefit analysis have been analysed for the difficulties they can raise in efforts to implement the kinds of changes demanded

by the contemporary understanding of flooding. The significance of economic pressures associated with the wider context in which decisions relating to flooding must be taken, have been noted.

The DEFRA points system has been identified as a significant element in the decision-making processes with regard to flooding. As such, this tool has been analysed with reference to the data and the conceptual literature. The cost-benefit aspect of the methodology has been examined as the key element in determining decisions. The qualitative aspects of the methodology are revealed as secondary to the economic cost-benefit analyses. The inclusion of the qualitative elements in decision-making (even at a secondary level) are reflected upon in relation to the data, revealing difficulties inherent in the means by which this is achieved.

Assumptions underpinning cost-benefit analyses have been discussed with reference to the literature in an effort to understand the processes by which costs-benefit analyses create difficulties in implementing the changes necessary to act for the long-term future in relation to flooding. There is a built in tendency to value the present over the future in calculations of costs and benefits. Valuing long-term benefits is thus difficult because of the nature of the methodology itself. Those solutions that provide long-term sustainability and may offer greater overall benefits (even in terms of economic cost) in the long-term, are not valued in the same way because (1) the propensity to value the present over the future related to the practice of economic discounting and (2) the difficulty in calculating and thus valuing more intangible benefits, such as those associated with the environment.

The necessity for risk calculation in evidencing decisions is highlighted as delaying the implementation of different approaches, as there is a need for past data in order to calculate risk reduction. There are noted difficulties related to temporality which arise in industrial capitalist societies. The connection between time and money is seen to create speed as valuable (Adam 1998). The pressures associated with time are discussed in relation to the difficulties in achieving data for risk calculation with regard to newer solutions for flood management. Together these two contextual aspects exacerbate efforts for change in approaches to tackling flooding.

The difficulties in relation to calculation are noted as being framed in the wider context of political decision-making. The obstacles to change in this respect are revealed to have deep roots in the present ways of living. Many of the issues which appear to arise in exacting change with regard to flooding are related to the fact that decisions must be taken in the context of competing social and political concerns. The necessity for calculation of costs and benefits in economic terms in relation to flooding relates to the requirement for funding in order to act to tackle flooding in any context and in any manner.

There are some changes that can be made within these constraints, however, even these are difficult to achieve. It is proposed that the focus thus falls not upon the integral issues with cost-benefit analysis and past calculation but upon securing and increasing funding. This is not intended as critique but as an observation as it is proposed that for those attempting to tackle these seemingly insurmountable difficulties the focus must fall upon that which is potentially achievable. The problems become ones of calculation and data to provide evidence and thus secure funding. The emphasis upon the particular formulation of evidence in terms of risk assessment creates past-based calculations as an important ingredient in proving the worth of a scheme.

Value judgements inherent in cost-benefit analysis relating to the propensity to value the present over the future and to preference calculable aspects of value over the non-calculable are overlooked in the drive to provide evidence within current constraints. These assumptions, however, arise as problematic in exacting change; at best they delay actions, at worst they defer the outcomes of present ways of doing to future generations whose economic prosperity is expected to compensate for the costs incurred to benefit the present.

The conceptual and empirical analysis together has provided insight into the difficulties engendered for change (particularly in taking decisions for a long term future) when decision-making is based on risk calculation and cost-benefit analysis. These observations have led to a questioning of the reasons for the increasing emphasis on risk calculation as flooding comes to be understood in light of contemporary knowledge(s) relating to climate change, land use and flood defence. If

risk calculation does not provide a solution to the difficulties in exacting the changes demanded by the contemporary understanding of flooding, why does an increasing emphasis on risk calculation arise in the policy approach to tackling the issue in the contemporary context? If risk calculation does not provide a solution but rather acts to slow the pace of change why does it become more pervasive in a context where change is required? The following chapter utilises elements of risk and time theory, provided by those authors whose works were discussed in chapter three of the thesis, for the explanatory capacity they can provide in understanding this increasing focus on risk calculation, despite its role in delaying change and transition to more sustainable ways of living.





## Chapter Eight

### Risk and the Future: Flood Risk and Climate Change

We no longer attribute evil to the indiscriminate forces of nature, to spirits from the netherworld, or to our own hapless misfortune. Instead, we convene public hearings to ascertain the ramifications of minute mathematical approximations and exchange information with one another on the latest scientific research reports so as not to fall victim to some hitherto unknown threat. (Cohen 2000: 4)

#### Introduction

The analysis thus far has provided insight into major difficulties to be overcome in tackling flooding understood in the contemporary context. There are significant hurdles to achieving implementation of approaches to flooding appropriate to the current understanding. In this context the policy approach gives increasing focus to a risk-basis for action in tackling flooding. The previous chapter examined risk calculation for the capacities it might provide in exacting change. The analysis revealed that in some senses a risk approach to decision-making can protract and delay change<sup>1</sup>. Given the difficulties that risk approaches to decision-making present for implementing the required changes, the questions arise: why risk? And why now?

In this final chapter the conceptual literature is utilised to shed light on these two questions which appear pertinent given the analyses in the previous chapters. Why is there an increasing emphasis on risk calculation, despite this making the apparent changes required difficult to implement? Moreover, why does risk rationality become more pervasive in relation to flooding, at a time in which it comes to be conceptualised in relation to climate change? These questions are addressed in this

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<sup>1</sup> The economic imperative and the role of treasury requirements for risk evidence have been noted. The focus here however, is upon the traditional statistical treatment of risk and the underlying conceptual significance of risk for societies.

understood as a contemporary problem and what the proposed solutions to flooding are given this context. The difficulties in addressing flooding in the contemporary context have also been explicated. The discussion in the thesis thus far has indicated a difficult situation in which the attempts to address flooding as it is understood in the contemporary age are stifled by conflicting priorities and ingrained approaches to decision-making. Significant difficulties were also noted in establishing solutions to flooding as a contemporary problem.

It has been asserted that the problems arose from a contradiction between the necessity to sustain the present way of life, and the roots of the contemporary problem stemming from practices inherent to the current way of living. The delineation of flooding in terms of risk has become clear through the study. The notion of risk management in relation to flooding has already been introduced as an emerging terminology for the processes of making decisions about tackling floods. The increasing emphasis upon the calculus of risk for informing those decisions has also been asserted. It was posited as interesting that flooding comes to be understood in terms of risk at the same time as it is increasingly associated with climate change.

In this chapter the demarcation of flooding as a risk and the use of the risk calculation to inform decisions about flooding will be the subject of greater scrutiny. The sociological lens is turned on the discourse to further elucidate this contemporary understanding of flooding. The risk literature as well as elements of temporal theory are utilised to shed new light on the issues at hand and provide some explanatory notions for the increasing prevalence of risk and risk calculation in relation to flooding. There is a distinct emphasis upon the European sociological risk literature which is in part a product of the geographical location for both the research and the researcher's prior academic development. However, it is also attributable to the conscious aim in this research project to bring together theoretical literature with

empirical study. Cohen (2000) notes the greater prevalence of a conceptual and theoretically based approach to environment in the European literature.<sup>2</sup> This European slant then in choice of literature can be attributed partly to a need to meet the aims of the research.

The arguments to be laid out in this chapter of the thesis pertain to certain distinctions made within social theoretical thought. As noted the works of Beck (1992a), Luhmann (1993) and Adam and Groves (2007) represent those primary texts utilised to inform thought and discussion. Both Luhmann and Beck, amongst others, make a three part distinction between *dangers* or *threats*, associated with pre-modern societies, *old industrial risks* emergent in modern society and *novel risks of contemporary globalised society* – emergent in the contemporary age<sup>3</sup>. This chapter aims to unravel and scrutinise these risk distinctions in relation to flooding.

In particular the apparent variation in the understandings of flooding as a risk and a danger are of interest, as are the contrasts between flooding as a form of risk and climate change as a risk. Issues, such as climate change, have been characterised as ‘novel risks’, possessing unique qualities, which make them unamenable to conventional risk calculation. Complex risk issues like this have been delineated as characterised by indeterminacies and as such are associated with heightened uncertainties. The emergent understanding of flooding in association with climate change is of interest in terms of the how this connection alters the contours of the issue of flooding.

The conceptual connection between risk and the future has been noted by a multitude of authors (Giddens 1990; Luhmann 1993; Rose 1999; Lupton 1999a; Adams 2007; Adam and Groves 2007). This connection is important in delimiting the modern risk concept as it is depicted as an important tool in taming the future and providing a firm

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<sup>2</sup> In the introduction to a collection of essays -compiled in an international collaborative effort between Europe and the USA- Cohen (2000) outlines the differences between US sociological studies and European studies, noting the empirical slant in the former and the more social theoretical framework of the latter.

<sup>3</sup> Luhmann (1993) utilises difference terminology and makes slightly different distinctions. This is discussed in more detail below. There are also differences in the extent to which risk is seen as entailing a different way of viewing happenings or weather there are qualitative differences to the issues to be faced that creates them as ‘risks’.

basis for decisions. These conceptual analyses will be applied in examining scientific risk assessments and their application in relation to flooding in light of the contemporary framing of flooding as symptomatic of climate change. The assertions in this chapter pertain to both the difficulty that an issue like climate change presents for 'risk' approaches and the significance of risk for modern societies in taming the future. A first point of call in these endeavours is in mapping the modern concept of risk itself and drawing out these afore mentioned distinctions from the literature and providing the theoretical context for discussion. It is with this task that the following chapter begins.

### **Risk and the Future**

Earlier in the thesis the concept of risk was given some form and risk was revealed to entail a particular kind of rationality, relate to decision contingency, and embody the principles of calculability, spreading costs over the collective and capital compensation. The connection between risk and future has been posited as fundamental to the concept of risk. For example, Adams (2007) describes risk as a word which refers to the future. The relation between risk and the future thus provides an important further point for analysis in delimiting the object of risk. Discussion of this aspect of risk entails an elucidation of the significance of risk for modern societies.

It is proposed that an examination of the importance of risk in the modern world may provide some understanding regarding the increasing characterisation of flooding as a form of risk in the contemporary era. The connection between risk and the future is asserted by a number of authors however not all of these clarify this relation in the detail provided by Luhmann (1993) and Adam and Groves (2007). These works will thus be utilised as primary tools in the discussion that follows for their explanatory capacities in this respect. Beck (1992) is also important in the discussion that follows for his assertions regarding the distinction between pre-modern and modern societies.

*Modernity and the Future*

Luhmann (1993) and Beck (1992a) distinguish between the tendencies in older societies to interpret uncertain events as danger and for modern societies to interpret them as risk. It is worth noting at this point the further distinction made regarding risks associated with early modernity and contemporary risks, such as nuclear technology. This will be discussed later in the chapter. For now the differentiation between danger and risk remains the focus. This distinction relates fundamentally to perceptions of the future, as these are categories for understanding things which have not yet happened. The emergence of the modern conception of risk is posited by both Beck and Luhmann as associated with an increase in uncertainty spurred by a change in the way the future is conceived in the transition to modernity.

Luhmann asserts that older civilisations developed quite different techniques for dealing with problems that are now understood as 'risk'. He points out that humankind has 'always been preoccupied with uncertainty about the future' but he suggests, for the most part trust was placed in divinatory practices (Luhmann 1993: 8). Although these practices were unable to provide reliable security they 'nevertheless ensured that a personal decision did not arouse the ire of the gods or of some other awesome powers, but was safeguarded by contact with the mysterious forces of fate' (ibid.). Luhmann (1993: 44) explains that, 'in the transitional period heralding the modern era, dependence on decision making increases and thus the value of paying attention to the future increases.' He attributes this to a shift from a state of affairs where 'much that had...to happen, [happened] more or less of its own accord' to a situation where these happenings require decisions and he continues, these decisions must be taken against 'a background of a greater range of choice, thus [having] higher information values'.

He suggests that this assertion inevitably leads to thoughts of technological developments and the resultant increase in production options. However, Luhmann continues, this only reveals part of what has happened; moreover, a part that only became significant relatively late. There are, Luhmann suggests, many other examples, whereby this shift to an emphasis on decisions and thus on the future domain can be seen. Luhmann refers to the example of developments in medical

knowledge of chemistry and biology, and suggests that as knowledge increases – and thus the perceived range of choices – disease is transformed from an ever present danger to a risk relating to a person's way of life. Similarly, and most relevant for present purposes, the transformation of flooding from a danger to a risk can be seen as related to increases in knowledge and to the emergent decision options. Knowledge regarding climate change, the detrimental effects of land use practices, flood defences and so forth, has been noted as of importance in the shift to characterise flooding in terms of risk. This epistemic underpinning denotes flooding as an issue created by or at least pertaining to certain decisions.

Luhmann (1993) suggests that the change to understanding issues as pertaining to decisions, offers an insight into the societal range of a new type of phenomenon. He argues however, that the novelty 'lies not in the feasibility [or] in the capacity of systematically shaping societal conditions' (Luhmann 1993: 46) Rather, the novelty lies in the unique 'expansion of the decision-making potential, in its more complex ramifications, in its greater wealth of alternatives' (ibid.) Thus, Luhmann proposes, this expansion leads to the transformation of dangers into risks. Luhmann continues and is worth citing at length here.

More and more states – whether existing or aspired to – are seen as being consequent to decisions i.e. are attributed to decisions. Much is due to the dual intervention of the more pervasive technological development and more pronounced individualisation of entities and processes formerly regarded as constituting nature. (Luhmann 1993: 46)

Thus, for Luhmann in the modern era there is an increased emphasis on decisions as creating the future; the future thus comes to be understood as risk. Once the future is construed as relating to decisions, each decision entails risk, since the necessary knowledge to ascertain whether or not the correct decision has been taken is never available when the decision is made. In Luhmann's view the emphasis on decisions means that risk arises whenever a decision is taken; there is always the risk of it being the wrong decision. Further, if no decision is made, the risk associated with not taking it and forgoing an opportunity arises. Luhmann characterises this shift to a focus on decision-making as key in moving societies to 'pay more attention' to the future. The modern focus on the future and upon decisions as creating it is held to heighten

insecurities in relation the future. Risk, in this context of increased insecurity, provides a means of calculating future possibilities and thus of improving the confidence with which decisions can be taken.<sup>4</sup>

This conceptualisation of the future in terms of decisions and risk is characterised as a specifically modern conception of the future; one which differs markedly from a traditional view of the future, in which the future is framed in terms of fate and divine will. Luhmann is not alone in making these assertions regarding the modern conception of the future. Cohen (2000) also notes this relation between conceptions of the future and the apparent shift from 'danger' to 'risk' explaining that,

Our penchant to express anxiety about the future in terms of risk is a relatively new pre-occupation that replaces old tendencies to view uncertainty in fatalistic terms. (Cohen 2000: 3)

Here Cohen highlights the emergence of 'risk' in relatively recent times, marking it as particular to modern societies. Adam and Grove's (2007) analysis of the modern conception of the future is not specifically focussed on risk, however, they make similar arguments regarding the significance of the future for the concept of risk. They characterise modern societies as being 'dedicated to progress, innovation and change' (Adam and Groves 2007: 1). Drawing on Bertrand de Jouvenal, Adam and Groves (2007: 1) suggest that 'the degree to which societies actively seek change, or permanence, has significant implications for their relation to the future'. They cite Jouvenal's observation that it is possible to feel greater security in knowledge for the future in societies where fewer changes are expected. Conversely, the validity of current knowledge for the future becomes increasingly 'doubtful as the mood of society inclines towards change' (Jouvenal 1967: 10 cited in Adam and Groves 2007: 1). Thus, modern societies with their tendency towards expected change are identified

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<sup>4</sup> There is a noted difference between uncertainty which can be diminished or reduced through risk calculation and indeterminate associated of the kind associated with contemporary socio-environmental issues like climate change. In his analysis of risk John Adams examines the distinction between risk and uncertainty. He enlists the work of Frank Knight amongst others in this endeavour. Knight (cited in Adams 1995: 25) identifies the difference in the following terms. 'If you don't know for sure what will happen, but you know the odds, that's risk and if you don't even know the odds that's uncertainty'. Indeterminate uncertainty, of the kind described here, is contrasted with the increased uncertainties faced in the transition to modernity which could be calculated and thus tamed through risk.

as having weakened purchase on the future in some senses. As in Luhmann's analysis, contemporary or modern societies thus are identified as experiencing greater uncertainty in relation to the future.

Adam and Groves (2007) explicate this difference between contemporary and traditional societies in more detail. In traditional understandings of the future, efforts to know the future are concerned with gaining knowledge of a prescribed future, which is accessible through prophets and oracles. They refer to these traditional notions of a pre-given future and are worth citing at some length.

Of traditional methods [for telling future] we can say that they were efforts to find answers to particular questions and gain foreknowledge of specific fates.... Over and above the individual differences between diviner's methods and sources of knowledge we can say that they share(d) an assumption that the future present is pre-given... (Adam and Groves 2007: 18)

Adam and Groves refer to the implication found in traditional ways of seeing and telling the future; that the future is pre-given. By contrast they identify prediction, forecasting and projection as contemporary industrial society's tools for telling the future and assert that these methods imply an empty future – one which can be decided upon. Adam and Groves (2007: 18) cite 'the degree of certainty that can be obtained by scientific methods of telling the future', as a noteworthy feature for distinguishing contemporary from traditional means of extending into the future. They assert that in certain respects scientific methods for telling the future can provide high levels of certainty. They provide the example of cyclical and regularly occurring natural events, such as planetary motion, as an instance where scientists can predict with reasonably high degrees of certainty that these will continue into the future. Thus, Adam and Groves (ibid.) explain, 'if one has full and extensive past knowledge of such processes, one can predict that in the same circumstances, the same conjunctures will occur in the same way in the future'.

In modern scientific approaches then the past is the basis on which scientific laws are established and the means through which science can reach into the future. In a similar vein to the means of scientific *laws* in securing prediction, risk is reliant on knowledge of the past, through which statistical patterns can be recognised, for its



extension into the future. Risk, as it is utilised in scientific assessment and prediction, is reliant upon past records and anticipation of things remaining the same into the future. Ayer (1965) provides a discussion of the various senses in which the word chance is used to refer to judgements of probability making a threefold distinction. Adams (1995) outlines Ayers distinction and examples as follows;

Judgements of a priori probability: "the chance of throwing double-six with a pair of true die is 36". Estimates of actual frequency: "there is slightly better than even chance that any given unborn infant will be a boy", and judgements of credibility: "there is now very little chance that Britain will join the Common Market". (Ayer cited in Adams 1995: 26)

Adams (1995) explains how the first two of these senses, often combined in the form of inferential statistics, are the basis of most treatments of "objective risk". Allied to the law of large numbers, these treatments provide useful guidance in decision-making. Adams gives the example of insurance company's consultation of past claims experience in calculating the premiums they charge to cover future risks. The past is thus the basis for risk calculation and the means through which it achieves its purchase on the future. The assumption underpinning is this outlined by Douglas and Wildavsky (1983: 68) 'one assumption [underpinning the utility of the risk method] is that what is true for the past will remain true for the future'.

Both Adam and Groves (2007) and Luhmann (1993) thus identify risk as being a way of extending into the future that is peculiar to the modern age. It has been posited that this conception of the future in terms of risk relates to the heightened insecurities induced by the modern age and the noted focus upon decisions. Risk, in this respect, can be seen as modern society's means of taming uncertainty in relation to the future. The means through which risk achieves its future taming capacity is through a reliance on past data to predict what might happen in the future. This is the subject of the following section.

### *The Future as Risk*

This emergence of risk in modernity has been characterised as a means of ensuring security in the face of the increasing insecurity and uncertainty bred through the

transition to modernity. This increasing uncertainty has been related to the tendency for modern societies to emphasise the role of decisions in creating the future and the expansion of decision options (Luhmann 1993), and the greater propensity in modern societies towards actively seeking change (Adam and Groves 2007), as well as the loss of the certitudes previously provided by religion (Beck 1992a). It has been suggested that in this context a new basis for acting needed to be found. The old cosmological limitations, the constants of being and the secrets of Nature were replaced by distinctions founded upon rational calculation and risk emerged as secure basis from which decisions about the future could be taken. In the face of future uncertainties risk serves to make them calculable. The transformation of 'dangers' into 'risks' is thus characterised as an important coping strategy in the development of industrial society.

In his examination of the emergence of the risk concept Luhmann asserts the significance of risk for modern societies in providing a secure base for the making of decisions. He refers to the work of Bacon, Locke and Vico, suggesting that it was out of their work that confidence in the feasibility of generating circumstances grew. He proposes that to a large extent it has been assumed that knowledge and feasibility correlate. This pretension, Luhmann asserts, is corrected to a degree in the concept of risk and the more recently established probabilistic calculation. However, for Luhmann (1993: 13) 'both concepts appear to be able to guarantee that even if things go wrong, one can have acted correctly'. As concepts they suggest that providing one can learn how to avoid error in decision-making failure can be avoided. This implication with regards to risk concepts is significant for the assertions made later. Luhmann (ibid.) points to the change in meaning of *securitas* that occurs; he suggests that 'whereas in the latin... the term had denoted... a negative value of heedlessness', later 'in French the term takes on an objective meaning'. It is worth at this point citing Luhmann at some length;

It is as if, in the face of an increasingly uncertain future, a secure basis for the making of decisions now had to be found. All this meant a vast expansion in the scope and pretensions of capability, and the old cosmological limitations, the constants of being and the secrets of Nature were replaced by distinctions falling within the domain of rational calculation. And this has determined the understanding of risk to this day' (Luhmann 1993: 13)

Beck provides a similar discussion of ‘the “invention” of the calculus of risk. Drawing on Francois Ewald (1986 cited in Beck 1992a: 100) he concurs that ‘the calculus of risk lies in making the incalculable calculable’ and asserts that ‘in this way, a norm of rules for social accountability, compensation and precautions, always very controversial in its details, creates present security in the face of an open, uncertain future’ (Beck 1992b: 100). He suggests that over the course of the development of instrumental rational control, integral to modernity, pre-industrial threats [taken here as similar to Luhmann’s danger] are transformed into risks.

Beck concurs that instrumental rational control, with its transformative quality of turning pre-industrial threats into risks, leads to the emergence of diverse systems of insurance, to the extent that society as a whole comes to be understood as a risk group. Consequently, he suggests, more and more areas and concerns of society that have been considered to be natural are now made social and individual, and therefore held to be accountable and subject to decisions. Beck sees the creation of ‘threats’ as ‘risks’ to be an important coping strategy in the development of industrial society. The loss of the certitudes of religion and the opening up of uncertainties through the modernity project required a secure place from which decisions could be taken; risk, for Beck, provides that basis. Through the invention of risk the unpredictable future is made the object of the present; that which is uncontrollable is transformed into something predictable. It is the dialectic of risk and insurance that provides the cognitive and institutional apparatus needed to achieve this transformation. Beck asserts,

This process is not only theoretically, historically and philosophically of importance, but also of great political significance, because here a stage in the history of how early industrial society learned to cope with itself is opened up and investigated. (Beck 1996: 31)

Beck posits this apparent learning process as potentially pointing the way to another modernity of self limitation as the present era grapples with the ecological question. This argument is not taken up here, however, it is not directly refuted either. The arguments here as they pertain to flooding are rather that, at present, muddled and strained attempts at coping with the contemporary contextualisation of the problem

appears to be the order of the day, rather than a new nascent society of self-limitation, but this does not mean that sometime in the future this possibility could not emerge.

Adam and Groves (2007) to some extent concur with Luhmann and Beck's assertions regarding the significance of risk for modern societies. They assert that 'for certain circumstances the shift to scientific methods has improved the degree of certainty with which social futures can be foretold' (Adam and Groves 2007: 18). They posit this increased certainty as being achieved through the emergence of probability calculations, which underpin risk methodologies. They explain that while social laws could not be identified as secure predictors of future behaviour as in natural science, probability calculations could predict the social future with a reasonable degree of accuracy. The emergence of probability calculations was, for Adam and Groves, key in providing increased certainty and security for contemporary societies.

They attribute this increased security with which the future could be viewed to the shift to tell the future, not for individuals, as in traditional approaches but for aggregates of individuals and facts. Adam and Groves (2007: 18) continue stating that 'with the application of statistical calculations it was possible to project those known figures into the future and predict social patterns... with surprising accuracy.' Moreover, the larger the database from which the predictions were deduced, the more accurate the probabilistic projections were. This, Adam and Groves (2007) assert, vastly improved socio-political planning and policy. Thus, and in line with Luhmann (1993), Adam and Groves (2007) identify the security and taming of uncertainty that can be associated with risk approaches to the future.

Numerous other authors have noted the significance of risk for modern societies in extending into the future. Rose (1999), for example, asserts the significance of risk as a tool for bringing the future into the present. Lupton (1999a) also asserts the significance of risk for modern societies and the role of risk in taming uncertainties in a world of change. She suggests that the contemporary world is depicted in 'by many commentators as characterised by uncertainty and ambivalence related to constant change and flux' (Lupton 1999a: 12). On this point she references Giddens 1990, Massumi 1994, Lash and Urry 1994, and Featherstone 1995, although she might have easily referenced several others. She asserts that the relevance of risk for its role in

denoting and in providing as capacity for coping with these indeterminacies associated with the contemporary age. She writes;

Juxtaposed against this world of change are the meanings and strategies constructed around risk, which spring from the uncertainties, anxieties and lack of predictability characteristic of late modernity and also attempt to pose solutions to them. Risk meanings and strategies are attempts to tame uncertainty, but often have the paradoxical effect of increasing anxiety about risk through the intensity of their focus of concern. (Lupton 1999a: 13)

Lupton thus notes the relevance of risk meaning and strategies for contemporary societies now in taming uncertainties with regard to the future. She explicates a 'paradoxical effect' in that it also acts to increase anxiety. A source of anxiety is noted here as relating to the difficulties engendered for risk approaches when applied to issues that are not amenable to such forms of calculation e.g. climate change. The limits of risk calculation for comprehension of such issues, is the subject of the next section. This author notes a paradox with regard to the increasing uncertainties associated with the contemporary age and the limits of the risk tool for providing security with regard to concerns associated with this heightened insecurity.

Not only Beck (1992a), Luhmann (1993), Rose (1999) and Lupton (1999a) but also Adam and Groves (2007), explicate risk as having significance for modern societies in predicting the future and thus in reducing uncertainty. This observation is frequently made through out the sociological risk literature and across the different perspectives with regard to risk, as is apparent from the discussion above. Beck (1992a) posits the risk tool in this respect as an important coping strategy for modern societies as the certitudes of religion are replaced with the questions of modernity. Luhmann (1993) emphasises a shift to the future as decision contingent in the modern age and the insecurity that this breeds, noting the apparent emergence of a need for a 'secure basis for the making of decisions' and denoting risk as the strategy through which this need was met. Significantly, Luhmann (1993: 13) notes the implication embedded within risk that 'providing one can learn how to avoid error in decision-making failure can be avoided'.

Adam and Groves (2007) similarly refer to the increased confidence derived from risk for dealing with uncertainties associated with social futures. Risk has thus been positioned as modernity's tool for coping with insecurities and uncertainties associated with the modern way of life. The assertions presented here have provided further elucidation of the risk concept, providing insight into its historical significance as an emergent tool for taming the nascent uncertainties about the future in the transition to modernity. This significance is extended in Lupton's (1999a) analysis to the contemporary era as the increasing prevalence of risk in the present, is depicted as a means of coping with perceived increased uncertainties associated with 'late modernity'. This extrapolation of the risk concept will be utilised in the remainder of the chapter for its explanatory capacities in relation to the current situation with regard to flooding.

It is asserted that the increasing prevalence and focus upon risk can be seen as a continuing application of the logic that problems can be averted through avoidance of error in decision-making (Luhmann 1993). This is achieved through the calculation of probabilities to ensure the correct decisions are taken - the reasoning which underpins this is that better calculation leads to an improved determination of the future probabilities, so that a superior decision can be taken. It is asserted here however, that the decisions to be taken with regard to flooding and are hindered by the (apparent) difficulty in enacting these changes in a complex, highly developed capitalist society such as this one.<sup>5</sup>

Constraints are imposed by the historical trajectory of development whereby ways of living and doing have become established and ingrained. As asserted in chapters six and seven these constraints limit the capacities for implementation of decisions when the decision options for solution entail practices that conflict with established ways of doing. It is thus proposed that in the contemporary age the focus increasingly becomes the calculation of risk itself. These assertions will be expounded subsequently, for now the characterisation of contemporary environmental problems as novel requires illustration for the analysis here to be taken forward.

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<sup>5</sup> The difficulties proposed here in enacting change are discussed in chapters six and seven of the thesis.

### **Risks Old and New**

Numerous authors (Giddens 1990; Beck 1992a; 1996; Luhmann 1993) have posited the contemporary age as being marked by increasing uncertainty exacerbated by a loss of faith in the notions of progress, knowledge accumulation and domination of nature as means of achieving human emancipation. Key to this shift is the emergence of contemporary socio-environmental issues which, as noted, are deemed as having novel risk characteristics. These assertions relating to the distinction between novel risks and the risks of the early industrial period form the focus of this section before they are applied to the issues of concern here i.e. flooding and climate change.

Risk as a category for understanding particular phenomena or events has come to take on new meaning or rather signify a new debate concerning contemporary issues (particularly environmental ones), whereby these issues are asserted as different, to those problems previously encountered in early industrial societies, for example. These contemporary concerns are discussed overwhelmingly with the language and conceptual reasoning of risk. A multitude of authors have highlighted something distinct about these contemporary concerns, which distinguishes them from issues previously subsumed within the risk category.

Strydom (2002) helpfully outlines the commonality between the various authors that have utilised this distinction. He explains that already in the late 1970's psychologists (e.g. Slovic, Fischhoff and Lichtenstein 1979) included the distinction between old and new among the properties they investigated from the perspective of the perception of risks. The author here notes that the distinction at this stage proved most significant in relation to nuclear technology. 'Newness' in this sense correlated with properties such as involuntary, catastrophic, dread and invisibility. These characteristics were utilised to distinguish issues like those associated with nuclear technology from problems previously faced, flooding might be one such example.

For cognitive psychologists (also referred to as the technico-scientific approach to risk by Lupton, 1999) the difference, however, was attributable to irrationality and emotionality, rather than being viewed as a significant distinction. Those risks

perceived as voluntary and familiar were seen as more acceptable and less likely than those perceived to be new or imposed. From the technico-scientific perspective the concerns regarding 'new' risks were construed as relating to an irrational focus on issues that were, from a risk perspective, highly improbable. This distinction between old and new was also not considered significant in the anthropological cultural theories primarily associated with Douglas and Wildavsky (1983). This trend within psychology and cultural sociological and anthropological work to ignore or deny any unique qualities for contemporary risks has been critiqued as facilitating 'the ineffective and barely legitimate authoritarian strategy that Wynne [exposed] in exemplary fashion in numerous of his publications' (Strydom 2002: 82).

Strydom explains that this authoritarian strategy entails experts, safety officials and government officials regarding public opposition to technology as a threat to civilisation, and he asserts an effort is made to lead people to accept that risks taken with high technologies today entail no more than the risks taken in the past. In contrast, for theorists who assert the necessity for a theory of contemporary society, - e.g. the risk society (Beck 1992a), or radicalised or high modernity (Giddens 1990: 150) - the distinctions between new and old risks are of central theoretical importance<sup>6</sup>.

There is some confusion in the literature due in part to various authors identifying the twofold distinction, discussed above as risk and danger, and only later developing the threefold distinction of danger-risk-new risk that is referred to here. Beck for example, in his 1992a work marks a distinction between old and new risks, but later in his 1995 work, identifies three distinct risk environments; 'pre-industrial hazards', 'industrial risks' and 'incalculable insecurities in the form of large scale hazards of late industrialism' (Beck 1995: 77). Luhmann adopts a comparable position whereby, as detailed above, danger is emphasised in older societies and risk in modern societies but asserts that 'today risk and danger come into conflict in a situation defined by high technology and the cumulative effects of decision-making' (Strydom 2002: 83). Giddens (1990) retains a two fold distinction between traditional and new risks,

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<sup>6</sup> Strydom (2002) notes that Luhmann's position entails a similar political outcome as those theories discussed above despite his retaining the distinction.



despite his adoption of a threefold model of traditional cultures-industrial society and high modernity. However, what is of importance is that all these theorists ascribe a unique quality to the new risks even if the distinctions they make remain in places unclear. Strydom (2002: 83) summarises that 'without exception, all of them assume that the new risks involve phenomena unknown until the late twentieth century'.

The lack of conceptual clarity, with regard to these distinctions, makes it worthwhile providing some terminology to clarify the three distinct categories that feature in multifarious ways in much of the risk literature, which will be utilised throughout the remainder of the discussion. In this thesis, the distinction is to be conceptualised as 'danger', to refer to the pre-industrial conception of threats as externally imposed from the gods or nature for example; 'conventional risk', to refer to those issues which have been conceptualised in risk terms for the modern era but do not possess novel qualities per se and thus are amenable to risk calculation; and 'novel risk', understood here to refer to contemporary risks, such as climate change and nuclear technology, held to possess some sort of new quality, in contrast to concerns faced before.

These categories and their relevance in relation to the issues under discussion here will be elucidated and critically examined in the following section. The task at present is to clarify the distinctions, and the characteristics which are held to create certain contemporary issues as 'novel risks'. The terminology outlined above will be utilised to clarify and draw the various arguments concerning this differentiation together. The features of conventional and novel risks can also be clarified with reference to the work of Adam (1998) and Adam and Groves (2007), which takes temporality as its focus but non-the-less comprises similar assertions regarding the novel qualities of contemporary (socio-environmental) issues. Before this task is embarked upon it is important to note that these categories are not regarded as universals they are put into use here merely to provide some structure, from which it is expected there are always deviations.

Intuitively, it has become clear to the researcher that there is some difference between the way floods have been conceptualised historically, held here to be akin to danger, and the way they are conceptualised in modern societies, as risk. This is of course not

regarded as a clear break, since floods continue to be undoubtedly conceptualised in terms of danger, but this understanding is now convoluted with a modern risk rationality that was not in pre-modern times apparent. The increasing prevalence of risk talk and risk calculation in the contemporary era is an important focus for discussion. It is significant that flooding comes to be increasingly conceptualised in terms of risk as it is positioned as a climate change impact. There is a noted difference between climate change as risk and flooding as a risk. Climate change is thus conceived here as a novel risk and flooding a conventional risk<sup>7</sup>. The intersection of these issues and the implication of this for flooding as a so called conventional risk is a focal point of interest here. It will be posited that when flooding and climate change are causally linked flooding moves towards the novel risk category.

Beck utilises a threefold distinction, beginning with his previously noted assertion of a shift from a pre-industrial concern with externally caused dangers, to a modern focus on risks and decision contingency. Beck (1992a: 22) also distinguishes, however, between those risks that 'kept the nineteenth century holding its breath' and 'ecological and high tech risks' of contemporary society which, Beck posits, 'have a new quality'<sup>8</sup>. The focus now is upon the arguments that contemporary risks, i.e. those associated with climate change and nuclear technology, are qualitatively different to risks faced previously. Beck explains the difference in these contemporary risks as stemming from their lack of amenability to risk calculation, their invisibility and intangibility and the unbounded spatial and temporal reach of their consequences. On this point Beck is worth citing at some length.

...the ecological and high-tech risks that have upset the public for some years now... have a new quality. In the afflictions they produce they are no longer tied to their place of origin - the industrial plant. By their nature they endanger *all* forms of life on this planet. The normative basis of their calculation - the concept of accident and insurance, medical precautions and so on - do not fit the basic dimensions of these modern threats. Atomic plants, for example, are not privately insured or insurable. Atomic accidents are accidents no more (in the limited sense of the word accident). They outlast generations. The affected even include those not

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<sup>7</sup> These structures will be set in place before they are problematised as again no universal claim is intended. Above all these distinctions are regarded as conceptual constructions although as previously asserted there is a delicate line to be walked between constructionist and realist arguments.

<sup>8</sup> It has been noted that Beck draws a threefold distinction in later work (i.e. 1995) however, the distinction is present in his Risk Society thesis it is merely a necessary clarification that is provided in later works.

yet alive at the time or in the place where the accident occurred but born years later long distances away. This means the calculation of risk as it has been established so far by science and legal institutions collapses. (Beck 1992a: 22)

Here, Beck briefly makes the arguments that have been presented to support the notion that contemporary environmental risks are in some way novel. As a consequence of their novel qualities these risks are asserted as not amenable to risk calculation. For Beck the tendency to deal with these contemporary environmental risks in the 'normal terms of risk' is a false but effective way of legitimizing them. In *Timescapes of Modernity* Adam (1998) makes a similar argument with regard to the novel nature of the contemporary environmental risks and the tendency for them to be conceived in the terms of conventional risk.

For Adam (1998), these particular contemporary environmental concerns (such as climate change) are characterised by their invisibility, immanence, (manufactured) uncertainty and indeterminacy. This, she notes, stands in stark contrast to the language in which these issues are discussed; i.e. 'discourses of scientific proof, certainty, prediction of the future based on knowledge of the past, risk calculation, and safety in the normal sense of the word' (Adam 1998: 37). Adam (1998: 37) also notes the reliance on sense data, measurement, the assumed homology between the materiality and the real and the 'almost exclusive focus on space' as a seemingly ill fitting conceptual package for dealing with issues characterised by immanence, invisibility and latency. There are then clear differences identified between novel risks, of which climate change might be considered one, and conventional risks, a category to which flooding might more easily be consigned. These differences are all implicated in the unsuitability of risk assessment as a tool for comprehending such issues.

Giddens (1990; 1991) draws a similar distinction between pre-modern and modern societies, which differs from that which Beck makes, although carries clear points of comparison. For Giddens (1990) the focus is upon trust and ontological security and the differences which affect these two tenets of social life. As part of this analysis he does however highlight a shift from a world where 'dangers' were viewed as emanating from nature or divine influences, to a world structured by humanly created

risks. Giddens utilises the term risk to refer to instances across both pre-modern and modern societies rather than ascribing 'risk' to the modern era per se, although he does identify 'modern risk' as different in the same way that the other theorists referred to here have done. Giddens also subscribes so called 'high consequence risks' with different qualities to other phenomenon that might be described as risks. It is not clear however when Giddens discusses the 'globalisation of risk' and the 'expanding number of contingent events' whether he would draw a distinction between flooding and climate change as risks, although it seems his notion of high consequence risks suggests he would.

In Luhmann's (1993) discussion of contemporary ecological problems he again makes not dissimilar arguments. Luhmann, however, extrapolates the notion of novel risks specifically in relation to high technologies, taking nuclear as his key example; his analysis is thus not as easily applicable to considerations of climate change. He does however extrapolate high technologies as in some way novel and as intimately connected to ecological concerns. For Luhmann (1993) the difference between what are termed here as conventional risks and novel risks lies in the relationship between the advantage attained from a new technology and the potential loss it may cause.

Luhmann posits this relation as having changed for the worse in the contemporary era. He explains 'if we compare the benefits of the steam engine with the risk of occasional boiler explosions... apparently what we refer to as high technology engenders real changes' (Luhmann 1993: 83). Luhmann's discussion remains of most pertinence to the discussion here in his elaboration of the risk concept through the risk/danger distinction as, in his terms it is decision contingency which marks a phenomenon as risk. There is then no objection from Luhmann's position about the suitability of the category risk for any particular phenomenon. His work thus has the same conservative political applications of those cultural theories which deny the difference between new and old risks but, in not refuting this distinction, he achieves a subtler argument (Strydom 2002).

There are clear and important differences between the assertions made by the authors referred to above. Of significance for the discussion here is that each of them takes up the argument that contemporary risks are in some way novel and involve phenomena

unknown before the 20<sup>th</sup> century (Strydom 2002). This observation, in its varying forms, can be utilised to distinguish between flooding and climate change and thus to better understand the two issues separately and the implications of their perceived interconnectedness.

In each of the assessments discussed above, it is clear that modernity is not yet a past era supplanted by a new distinct phase, as claims of post-modernity might be taken to indicate, but that there is something different about the present era which is contrasted with an earlier modernity. The emergence of knowledge about contemporary environmental 'risks', which have novel characteristics, is acknowledged as only one feature, of many, which is seen to distinguish the now (or at least the last 30 years) from that which has gone before. It is considered important to acknowledge the wider arguments and associated comments on the contemporary age however the focus here is only upon the aspects of 'risk', as a discursive and conceptual phenomena, that relate to environment.

Flooding as an issue has been conceived differently across time. It follows from the analysis here that it can and has been interpreted in terms of danger and risk. It is only in the contemporary era however that flooding comes to be increasingly represented in terms of risk and a more pervasive focus on risk calculation arises<sup>9</sup>. The corresponding emergence of a focus on causal links between flooding and climate change arises as interesting in this respect. In the section that follows the discussion will centre upon the notion laid out here of a distinction between conventional and novel risks.

The question to be answered now is where do flooding and climate change fit into this schema of conventional risk-novel risk? What happens when a commonly regarded conventional risk, which can also be viewed as danger i.e. flooding, intersects with a novel risk i.e. climate change? How does this affect the way that flooding is understood and what does this mean for the way it is tackled? How might these considerations contribute to understanding the greater tendencies towards conceiving

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<sup>9</sup> As noted these claims only extend to the English (and to some extent Welsh) representation of the problem, as the empirical work is derived from these countries. No claims regarding the understanding of the issue are intended to extend or be generalised beyond this specified scope.

flooding in terms risk calculation and management identified in previous chapters? The conceptual ideas discussed thus far will be drawn upon to distinguish between flooding as a risk and climate change as a 'risk' of a different kind. The conceptual differences between risks are important if the consequences of the nascent understanding of flooding as a symptom of climate change are to be seen.

### **Flooding and Climate Change as Forms of Risk**

Flooding is identified here as 'a conventional risk'. This is in contrast to anthropogenic climate change that can be demarcated as a 'new' or 'novel risk'. Clearly, climate change is an age old phenomenon; however, the recognition of human influence upon climate, and subsequent desire to determine that influence, creates human induced climate change as (in some senses) novel risk. Of interest are, the implications for understanding (and thus tackling) flooding as an issue when it is conceived in association with climate change, and the questions posed at the beginning of the chapter regarding the increasingly pervasive risk-basis with regard to tackling flooding. The explanatory capacities of the conceptual literature in this respect will be the subject of scrutiny in the discussion which follows. Initially, the assertions regarding the novel qualities of contemporary hazards and their consequent lack of amenability to calculation require unpacking specifically in relation to climate change. The writers that have been discussed thus far tend to take nuclear technology as their key example of contemporary or novel risk. It is thus necessary to spend some time explicating climate change as a novel risk, as well as expounding flooding as a conventional risk.

In chapter five, Adam's (1998) assertions with regard to the distinct nature of issues like climate change were introduced. Contemporary socio-environmental hazards were highlighted in terms of their unique temporalities. From a timescape perspective, issues like climate change can be seen to be characterised by their 'unboundedness, non-proportionality, time-space distancing, contingency and a high level of indeterminacy' (Adam 1998: 81). Such industrially produced hazards are often characterised by invisibility and periods of latency after which outcomes are no longer traceable with certainty to original sources. As social problems they are only recognisable after they have been identified through the mediated loop of science and

once they have been brought to public attention. These features are of central significance in the intractable difficulties encountered in attempts to calculate climate change in terms of risk. In relation to these temporal features a distinction can be drawn between flooding and climate change. In distinguishing these issues from one another it is possible to understand better the conceptual implications of conceiving of flooding as connected with climate change.

Flooding as a risk is material when it occurs<sup>10</sup>; there are physical, observable effects. It is temporally and spatially bounded; that is, occurrences of flooding happen in specific, identifiable spaces and at particular times for knowable durations. Flooding can be attributed to rainfall, runoff, land development and numerous other visible and (to some extent) measurable factors. In contrast, climate change is not material in the same way. It is knowable or observable only through its identification by scientific institutions<sup>11</sup>. Climate change is neither spatially nor temporally bounded and it is invisible until its symptoms materialise as observable effects. Significantly, no direct and unambiguous causal relation can be established between climate change and its visible effects, due to the time-space distanciation<sup>12</sup> involved, that is, its extensive temporal and spatial distribution.

Adam (1998) explains that these temporal dimensions create specific difficulties in understanding issues like climate change in terms of risk. The time lags, latency periods, broken chains of events, and the interaction of rational technological systems with open, generative ecological processes create indeterminate uncertainties. With regard to issues characterised by such features 'the future cannot be managed on the basis of past experiences' (ibid.). Beck (1992a) has designated the shift to risk society as marked by the insurance threshold. He explains that a distinguishing feature of novel contemporary socio-environmental issues is that they are '*not insurable*' (Beck 1996: 31). Flooding (at least in the UK) remains an insurable hazard, which is indicative of the capacity for conventional risk calculation. Climate change, in

<sup>10</sup> In some senses anything that is conceived as risk is immaterial since risk refers to the future- to that which has not yet happened.

<sup>11</sup> Beck (1992a) outlines a paradox inherent in contemporary society; science is identified as one of the causes, the medium of definition and the perceived source of solution for the risks to be faced in the contemporary era.

<sup>12</sup> Distanciation is a term which originated in the work of Anthony Giddens (1990; 1991) and is used to indicate spatial and temporal distancing specific to the contemporary age.

contrast, cannot be insured against. Indeed, the very connection between flooding and climate change in the UK threatens to create flooding as uninsurable<sup>13</sup>.

Where flooding has been conceived and understood differently over time, the specific notion of human induced climate change can be seen as emergent. The earliest awareness of human actions influencing climate has been ascribed to Arrhenius in 1896 (Christianson 1999), while the contemporary consciousness, wherein anthropogenic climate change reaches the status of a global threat, is suggested to only reach back to approximately the 1980's (Adams 1995; Jager and O'Riordan 1996). In contrast, the capacity to know flooding through sense experience means that flooding has been 'known' about (albeit conceived in differing ways), experienced and perceived as a threat as far back as ancient societies<sup>14</sup>. There are thus notable differences between flooding as a form of risk and climate change as a risk which might justify the description of climate change as novel. These differences are all implicated in the amenability of these issues to risk calculation.

Achieving sense data and extrapolating it for calculation of flood risk is undoubtedly difficult. However, it does not entail the same kinds of complications associated with climate change. That is to say, with regard to anthropogenic climate change scientist's predictions are based on extrapolations far beyond the range of available data (Adams 1995). These 'extrapolations are based on assumptions about the nature of the process being predicted for which firm, uncontentious evidence is not available' (id. 163). To achieve understanding of the climate very long-term measurements of the Earth's atmosphere are required. Direct measurements of global temperatures have only been recorded for approximately the past 140 years. It is thus necessary in the case of climate change to extend the records back in time but without the necessary data base of measurements. To extend these records back in time, scientists utilise evidence of past atmospheric conditions preserved through natural processes. For example, extract longer term data from glacial ice cores, tree rings, lake-bottom sediments, and ocean corals, to estimate global temperatures thousands of years in the past. A significant

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<sup>13</sup> Participant 9 (ins.) was cited earlier referring to 'the very real risk of insurers saying we can't insure what we don't understand'. The emphasis on the links between climate change and flooding in the insurance sector was also pointed to in chapter four.

<sup>14</sup> Ancient, biblical and mythical stories of floods (Sandars 1972; Cavendish 1980; 1983; Leeming 1990; Rosenberg 1992) were the subject of analysis in this author's MSc dissertation.



element of (indeterminate) uncertainty constituted as error margins thus arises in attempting to calculate climate changes. The Intergovernmental Panel for Climate Change report in 2000 explains that such complex interactions over timescales of decades are not open to conventional quantified risk analysis (IPCC 2000).

The nature of anthropogenic climate change as an issue thus means that it is not amenable to conventional risk calculation. There are a number of reasons for this: The number of variables involved; the long-term nature of climate changes; the time lag between changes in emissions and indicators of climate change (such as global mean temperature<sup>15</sup>), as well as the time-lag and lack of causal relation between changes in climate and visible impacts (Evans et al 2004b: 26). These issues in risk calculating anthropogenic climate change are explicated to better understand the differences between flooding and climate change as socio-environmental issues. A level of heightened (indeterminate) uncertainty with regard to flooding is asserted as being created by the association with climate change.

The identification and prediction of climate change is achieved utilising high powered computers to model the global climate (Shackley 2001). Scenario techniques are then utilised to predict the likely changes in global conditions that climate changes might cause. It is suggested, however, that this does not provide the security associated with risk calculation because that security is derived from the application of (empirically accessible) past knowledge and observation of causal chains. Through risk calculation uncertainties can be tamed but issues like climate change entail indeterminate uncertainties, which are thus not resolvable. With regard to climate change, the lack of empirically observed data over the required timescales (thousands of years), means that the calculated future is only known with a more significant degree (or rather, a different indeterminate kind) of uncertainty than that associated with conventional risk assessments.

The future, with regard to issues like climate change thus cannot be tamed through conventional risk calculations. Such issues are characterised by indeterminate uncertainties that no probability calculations can abate in the same ways associated

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<sup>15</sup> There are additional uncertainties in establishing indicators like global mean temperature (see Adams 1995).

with conventional risk. This distinction between flooding and climate change as issues and their amenability to risk calculation is made to understand the contrasts between the 1) limits of a reliance on risk for decision-making and 2) the significance of risk in taming uncertainty in relation to the future.

The significance of risk as a tool for enabling decision-making in modern societies has been elucidated and will be posited as holding explanatory capacity in relation to the heightened emphasis on a risk basis for decisions about flood management. The conception of flooding as symptom of climate change is held to have implications for the amenability of flooding to risk calculation and thus for decision-making. There are notable difficulties with regard to flood risk calculation and modelling without the implications of climate change. The quote below is indicative of the difficulties that participants expressed with regard to risk modelling and calculating flooding without factoring in climate change.

Even with the science that we've got we do a lot of guess work. So we've got computer modelling of watercourses and typical flood events and that's supposed to be the bible to which we work but even that is, there are so many variables with that, that it begs belief actually how much money we spend doing computer modelling that no-body ever believes, so you think why do we do it? (Pol. Participant 13)

The intersection between climate change and flooding, however, creates heightened complications and uncertainties in understanding and determining flood risk for the future. The capacity for risk calculation with regard to flooding is unsettled by the connections made with climate change. It is asserted that when a so called novel risk (i.e. climate change) intersects with a conventional risk (i.e. flooding), the nature of the latter is altered. Flooding comes to be conceived as an issue that could become worse in the future in indeterminate (rather than uncertain) ways. Indeterminate uncertainty is contrasted with the increased uncertainties faced in the transition to modernity which could be calculated and thus tamed through risk.

The degree of certainty with which flooding can be predicted utilising risk techniques becomes weakened by this large element of indeterminate uncertainty introduced by climate change. Even without flooding being understood in association with climate change the issue posed difficulties for accurate risk calculation as there are multiple natural and social variables involved. The complexities involved in modelling flood

risk, however, do not entail the same kinds of issues associated with calculating climate change. The intersection between climate change and flooding thus creates additional difficulty and uncertainties in accurately representing flood risk.

At present, what might be termed 'conventional' risk assessments of flooding are conducted and an allowance for climate change impacts is included. This national guidance (noted in chapter six) is delivered by the Department for Environment, Food and Rural Affairs and the Environment Agency. It has been asserted that this guidance can be seen as an attempt at epistemic closure, necessary for climate change to be incorporated in flood designs. The guidance recommends a precautionary 20% increase in flow to allow for climate change in terms of fluvial or river flooding. Thus, fluvial flood alleviation schemes must be able to withstand an additional 20% increase in flow to allow for climate change. There are also precautionary estimates for sea level rise, set at 4mm/per year, 5mm/y and 6mm/y. These vary according to which part of the coastline is being assessed. To account for sea level rise defences must be built taking into account the 4mm, 5mm and 6mm per year estimates. These figures are derived from estimates provided by the United Kingdom Climate Impacts Programme. The figures are positioned here as representing the introduction of certainty in the face of indeterminate uncertainty necessary for calculation<sup>16</sup>.

This epistemic closure is deemed necessary to make the knowledge regarding association with climate change amenable to inclusion in risk assessments. The precautionary estimates, as explained in previous chapters, find application in the construction of higher flood defences or more robust flood barriers. For example, (and to over-simplify) the highest water level which a flood defence barrier needs to defend against is estimated utilising what might be termed conventional risk modelling and assessment techniques, then to 'future proof' that flood barrier for 100 years into future, for example, the barrier would be built (up to) 6 metres higher. This issue has been raised by a number of participants and has been discussed in others chapters of the thesis. The quote below is indicative of the difficulties inherent in such an approach when the lens of the long term future is focussed upon it.

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<sup>16</sup> Beck (1992a) refers to the this notion of inventing new certainties for oneself and others in relation to the individualisation processes which he sees as private side of the globalisation processes in reflexive modernity.

Interviewer: Do you factor in climate change in the environmental appraisals?

Participant: That's an interesting one, yes because we have to. Um... crudely, the EA locally on coastal stuff, trying to get the number right, I think it is five millimetres a year, up to maximum of six hundred mil by 2050. For example, in Royal Parkland Yard which is a development in Hartport along the coast, we've had to build a one metre pathway on top of the old wharf in effect to protect the site from a hundred year tidal flood which has got that climate change allowance in it.<sup>17</sup>

The construction of higher walls as a solution to flooding in the context of climate change has already been highlighted as problematic, given the difficulties that defending against floods present for highly developed countries such as the UK i.e. there are limited places for the water to go that are not also developed areas. These issues, associated with the consequences for actions of incorporating climate change estimates, and the re-emergence of uncertainties at locally negotiated levels has been discussed in chapter six. The focus here is on issues that arise specifically in applying risk calculation to flooding once it is understood as a climate change impact. Such difficulties in calculation with regard to interpreting flooding as a climate change impact are highlighted by participants. The interlocutor below describes the determination of figures for inclusion of climate change impacts in flood risk estimates as akin to holding a finger to the wind.

Quite simply with the pre-existing advice provided by DEFRA you're advised to allow for an increase in flow due to climate change of up to 20%. However, these figures are really quite arbitrary, akin to holding your finger in the wind. (Acad. Participant 11)

This participant notes the inherent uncertainty in determining estimates of climate change with regard to flooding. Participant 15 (P.PI) described the processes of predicting the effects of climate change as 'a dark art'. Significantly, this participant suggested that the implications relating to changes in current practices were 'huge'. They stated that there has to be a 'sound basis' for the implementation of changes such as this. As has been demonstrated, such a 'sound basis' for decisions is the very purpose of the risk tool. Beck (1992a), Luhmann (1993), Lupton (1999a) and Adam and Groves (2007) all point to the significance of risk in providing a means for taming

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<sup>17</sup> All place names are pseudonyms.

uncertainty in relation to the future and providing a firm basis for the taking of decisions in the present.

Beck (1992a; 1996) and Adam (1998) also highlight the differences in the risks, and thus the indeterminate uncertainties to be faced with regard to novel issues, in this contemporary age. Indeed, for these hazards (climate change being one such issue) the language of risk seems inappropriate. In this context, the risk tool is highlighted as limited in its capacity to provide the security associated with past-based prediction and conventional risk prediction. The tool can still provide an indication of what might be expected, but in this situation does not provide the security, which is apparently required for actions, particularly when the magnitude of change is significant. The continuing (and increasing) prevalence of risk, however, is asserted here as indicative of the significance of such a concept for coping with uncertain futures.

In relation to flooding, taking the kinds of difficult decisions required, and acting on them, has been highlighted as being delayed by the risk calculation required before changes are implemented (see chapter seven). In this respect, it is interesting that a more pervasive focus on risk calculation has been noted, as flooding comes to be understood, in the contemporary context, as requiring changes in approach. Add to this the limits of risk calculation in taming uncertainties in relation to climate change and the heightened risk focus becomes more interesting still (since flooding is now understood in association with climate change).

Earlier in this chapter, the significance of the emergence of risk for modern societies was asserted. The importance of risk for taming uncertainties in relation to the future was highlighted. This important feature of risk and risk calculation is held to hold explanatory potential for the increasingly pervasive focus on risk with regard to flooding. It is has been asserted that as flooding comes to be interpreted as a symptom of climate change the future with regard to the issue becomes increasingly uncertain. As noted, climate change involves indeterminate uncertainties, which are implicated in deriving knowledge of flooding as it comes to be understood in this context. The utilisation of risk tools for gaining knowledge of flooding seems less appropriate,

rather than more necessary given this context, yet as noted risk and risk calculation becomes increasingly prevalent.

Here, apparent contradiction is explained through reference to the theoretical analyses of risk discussed earlier, wherein risk is represented as the primary tool through which modern, and now contemporary western societies, have learnt to cope with the difficulties engendered through conceiving of the future as empty and decision-contingent. It is thus proposed that faced with uncertainties (indeterminate or otherwise) recourse to this tool continues in the lack of any other way of reasserting order and regaining control. In this situation, the emphasis falls upon calculation and evidence to provide means for making decisions. The answer to the question 'why risk?' is thus seen as related to the security that risk provides for decision making in the face of uncertainties. The answer to question the 'why now?' is posited as connected to the heightened uncertainties associated with flooding in the contemporary age as it comes to be understood in association with climate change (despite the indeterminacies associated with climate change).

It is suggested further that the decisions, which the contemporary understanding of flooding demands, entail significant changes to ways of living e.g. these changes have been linked to development practices integral to the current way of life (see chapter six). The increasing focus on risk calculation was posited above as related to the heightened uncertainties that arise as flooding is associated with climate change. These uncertainties (related to knowledge) are coupled with the magnitude of the changes that this contemporary understanding of flooding implies. In this situation it is posited that risk calculation is increasingly emphasised as important, as it provides a base for decisions (even when that base is unsettled by indeterminate uncertainties in knowledge).

The difficulty noted for the contemporary age, is that the issues to be faced require a fast pace of change, where risk calculation acts to delay such shifts in practice. In addition, the solutions and the decisions to be taken relate to a requirement for changes rooted in practices integral to sustaining capitalist industrial society. This means that time and consideration needs to be applied to finding new approaches. The changes required with regard to flooding are, as noted, limited by the legacy of

development and by the imperative to maintain present ways of living. Recourse to notions of sustaining the current way of life, and dealing with the contemporary problems associated with that very way of life, remains. This appears to manifest itself in a focus on improving the risk tool so that better calculations might lead to better decisions. Yet, significantly it is the decisions themselves which pose the problem for contemporary society. The implementation of the decision options is the true difficulty as the resultant actions require changes in the way of living; no amount of calculation will alter this difficult context. As Ewald (1991) notes however, the key feature of risk is its capacity to transform fear into opportunity, thus in a world seeking change and progress risk offers more than just a methodology, it provides a way of thinking about the world which emphasises the opportunity side of decisions.

Significantly, then, the shifts required to tackle flooding in this new context of climate change require changes to historically ingrained ways of doing things – both those associated with mitigating climate change itself and those with adapting ways of living to allow a greater capacity for coping with flooding events. The ability to implement such changes is, however, heavily constrained by the trajectory of development. It is proposed that in this context the focus falls upon improving risk calculations. Moreover, that this is underpinned by the notion that improved risk calculation will lead to better decisions. It is suggested that the problem comes to be formulated as one of knowledge or information. The focus falls upon risk methods themselves and on improving these tools for decisions. As an approach this encourages responses that remain within the confines of the current way of living, rather than facilitating significant change.

### **Concluding Remarks**

Previously in the thesis, analysis of the discourses revealed an emergent characterisation of flooding as closely associated with climate change. The conception of flooding as a consequence of climate change heightens doubt in relation to the future, as uncertainties with regard to climate change translates into (indeterminate) uncertainties about flooding. Solutions, such as hard defences (previously appropriate for tackling flooding) are highlighted as inadequate, both because of the difficulties they cause in increasing flooding and the limits to such devices when viewed in light

of climate change and the long-term future. The contemporary contextualisation of the problem as being caused, or at least exacerbated, by aspects of the current way of living, creates the solutions as ones of changes to those ways of living and doing. The magnitude of the required decisions is coupled with indeterminate uncertainties relating to the knowledge that indicates the changes are required i.e. knowledge associated with climate change.

This creates a difficult situation which appears to be met by an increasing focus upon improving risk calculations (the tool for predicting the future and informing decisions) and risk management (making decisions according to these calculations). This heightened focus on risk calculation, at the same time as major changes in approach to flooding are required, is seen, paradoxically, to delay change. Risk calculation can however, be seen as a strategy for coping with the seemingly intractable features of the problem. That is, risk calculation can help in providing a basis for the decisions required when faced with uncertainties, thus helping to provide a secure base for implementing those decisions which entail a high magnitude of change.

Importantly, in this chapter the conceptualisation of flooding, an old risk, can be seen as being altered through its re-framing as a symptom of climate change - which has been described as entailing characteristics associated with so called 'novel risks'. Novel risks can thus be seen as affecting other issues which might previously have been regarded within the remit of 'conventional' risk (Beck 1992a). Novel risks should not be viewed as isolated concerns, which do not affect ways of conceiving of other concerns. The intersection of a novel risk with problems that have been regarded as conventional risks means the latter are transformed into something 'other'. The capacity for the methodologies and conventions of 'risk' to be applied in these circumstances is thus also altered. This has important implications if the roots of 'risk' are to be believed and the significance of risk is as a coping strategy for modern societies.

Risk, as noted, implies that error in decision making can be minimised through calculation. Further, that if error in decision-making is avoided then failure (whatever failure might constitute) can be avoided. If 'failure' in the contemporary age is



characterised by the failings of the present generation to create a sustainable way of living, then the risk logic implies that better risk calculation and thus better decision-making can avert this failing. This thesis has shown that this is not the case, as the complex difficulties faced in tackling flooding are revealed through the research participant's narratives. The hurdles in exacting change are related to practices past and present integral to the contemporary way of life. The past legacy of development, the imperatives for continuing development and the significance of strategies of defence, combine to make finding ways of tackling flooding appropriate to contemporary knowledge(s) intractable.

The complexities implicated in these difficulties have been revealed through discussion of the research participant's expressions of the multiple considerations involved and conflicting priorities that arise in their daily workings. The heightened focus on risk calculation can be seen to serve as a distraction from the always uncertain awareness that the problems of the contemporary age stem from the very way of life itself, that the decisions to be taken are ones which relate to fundamental changes in ways of living. This awareness, of the complexities and contradictions evident in attempting to address flooding in the contemporary context, requires sufficient space for expression in the practices associated with tackling flooding. Finding ways of creating room for such dialogue and engagement is important for facilitating means of tackling flooding as a contemporary problem.



## Chapter Nine

### Conclusions

I'm a pessimist because of intelligence, but an optimist because of will  
(Gramsci 1891-1937)

It can never be the task of an empirical science to provide binding norms and ideals from which directives for immediate practical action can be derived... An empirical science can not tell anyone what he should do - but rather what he can do'. (Weber 1904/1949: 54)

A timescape perspective... promotes the recognition that our relationship to time is centrally implicated not only in the industrial way of life but also in any conscious construction of a sustainable future. (Adam 1998: 56)

The past few months have seen some parts of the country devastated by floods. These recent events serve only to make the analysis herein of increasing pertinence. Though no solutions are offered to the difficulties discussed in this thesis it is asserted that without fully understanding a problem no truly adequate solutions could be found. This means that it is important to raise difficult questions to which there appear no immediate answers. It is necessary to present social issues in all their complexity and acknowledge the true difficulties that they present for contemporary societies, for without this foundation of understanding - even if the problem appears irresolvable in light of such understanding - any attempt at resolution will remain illusive or inadequate.

The arguments in this thesis position the notion of risk and the practices of risk calculation as of central importance in legitimating and assisting decision-making in complex modern societies. Risk is characterised as significant in removing the paralysing effect of acting in the face of an uncertain future viewed as determined by human choices and decisions. This conceptual significance of risk is posited as integral to the increasing prevalence of 'risk talk' and the focus upon risk calculation in relation to flooding. The uncertainties with regard to flooding are heightened

through its association with climate change and the scale of societal changes implied by this understanding. The increasing emphasis on risk calculation and rationality are viewed as means of addressing the insecurity bred by this knowledge. The urgency of the actions required, and the indeterminacies which arise through the climate change understanding, however, limit the capacity of a risk focus in terms of achieving security for decision-making.

The combination of risk assessment and cost-benefit analysis for decision-making has been found to limit capacities to act upon flooding in ways congruent with the contemporary understanding of the problem. The conceptual and empirical analyses reveal that these approaches to decision-making constrain capacities to deal with flooding as it is now understood. Conceptually and empirically, they can be seen as serving to maintain the present and the short-term future as the priority over the long-term. The legacy of the past acts to constrain decision options and limits the capacity to create a different future. However, this difficulty of effecting change is re-enforced rather than addressed, through risk calculation and a discourse of risk management. In Adam's terms the embedded and contextual future is already in the making, continually being created through our actions in the present. Only in changing those *actions* can one create a different future.

The focus on risk is seen as creating flooding not as a problem of enacting change but as one of information, knowledge and data. More or better knowledge to inform better decisions is thus the solution to the problem. While calculation can be useful in informing decisions it does not represent an adequate means of tackling flooding in the contemporary context. The problem is not with research or with risk assessment in itself. Rather, difficulty arises at the decision-making level, where there is an apparent conflict between the maintenance of current ways of doing and the changes necessary to address flooding in the contemporary context. These changes relate not to anomalies in the social order but to activities, practices and approaches embedded within contemporary society. The difficulty is that the barriers lie not only in making hard decisions but rather in enacting changes against a past legacy and historical trajectory of development. In this context no amount of risk calculation can change the nature of the decisions themselves or the barriers to implementing those decisions. Risk is posited as a coping tool that is increasingly clung to as a means of ordering

problems which pose threats to the notion of institutional control. This is damaging to the extent that it serves to limit and delay change.

The difficulties in finding ways of tackling flooding in the current context of historical practices are of paramount importance. Risk assessment can provide a base for decision-making but it does not provide answers for acting in a way that truly addresses the issues with regard to flooding. Everyday knowledge(s) with its greater scope for imagination may provide the openings needed to find answers (Welsh 1994; Wynne 1996; Adam 1998). This is suggested as a possible pertinent topic for further research. The broader knowledge bases that each of us draw upon in our day-to-day lives provides a more rounded capacity for finding ways of addressing difficult issues. When thought about abstractly at a societal level these issues appear insurmountable because, although the answers are there, they implicate a fundamental change in our ways of life. However, on a smaller scale it is possible to recognise the capacities for the enactment of change.

This research has identified a continuation of practices inconsistent with the contemporary knowledge(s) through which flooding is given form as an issue. Amidst the complexity, however, a mish-mash of muddled attempts at finding ways of tackling flooding congruent with the present understanding are revealed. It is suggested that these efforts towards change require a capacity to work against established ways of doing which is considered as problematic. In this sense the study has highlighted what O'Riordan (2001: xx) eloquently summarises as a 'frustrating contradiction: a lot of turbulence, plenty of 'old order' survival, but glimmers of hope'. Those elements of hope are found in the individuals that make it their challenge to find ways through the barriers which are to be faced in exacting change.

Fluidity in decision-making practices and procedures is required to facilitate the capacity for a shift in practice(s) more closely aligned with the contemporary knowledge(s) that shape understanding of flooding. Finding ways through is, however, not easy and there are many actions and processes that the current ways of living require which delay change. The notion of 'muddling through' is utilised to describe the means by which people cope with the contradictions between contemporary knowledge(s) and practices. This research has not been about providing

solutions but about creating a deeper understanding of the issues to provide greater clarity and open up spaces for pause and reflection that might enable practitioners to see scope for change.

### **Epilogue**

This research was conducted during a period of policy and conceptual flux in the flood management domain. As such, developments in policy were underway to further the kinds of changes proposed for aligning practices with the contemporary conception of the issues. The creation of the Local Development Framework (LDF) and Shoreline Management Plans (SMPs) are examples of such developments. The implementation of the risk-basis for decision making and the wider flood policy are heavily implicated in these plans. This thesis has examined the risk-basis for the extent to which it is compatible with the aims of shifting to more sustainable flood management practices and planning. Within this, the wider implications of the risk basis were discussed in terms of the 'blighting' of some communities, which do not qualify for a flood management scheme. In my final reflections, it seems important to return to a critical assessment of the implications of the developments in flood policy for addressing flooding in 'sustainable' ways, when 'sustainability' means more than 'economic sustainability'.

Under the LDF<sup>1</sup> new local development documents (LDD) were being created at the point when I conducted the field research in 2005. The LDDs entail a shift in planning policy to make 'sustainability' integral to the designs and future plans. Consideration of flood risk and new approaches to flood management (e.g. reducing flood risk by means that work with natural processes) will be built into the LDF plans. This research provides an indication of the challenges to be faced in implementation of these differing approaches to flood management when pressures for development and flood protection remain. The creation of the LDF, with its explicit incorporation of sustainable development, is likely however to further the creation of a culture in which implementation of changes in the direction of sustainability will be easier to achieve. Questions still remain as to the difficulties in balancing competing

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<sup>1</sup> The Local Development Framework replaces the previous system of county level Structure Plans and district level Local Plans, and Unitary Development Plans for unitary authorities.

requirements in planning, and the necessities to meet cost-benefit and risk reduction criteria.

The assertions in this thesis point to the need to scrutinise current policy plans and the 'risk-based approach' for the extent to which they result in actions that can be considered 'sustainable'. In this respect the implications of Shoreline Management Plans (SMPs), which involve the application of risk and cost-benefit appraisal criteria for deciding whether coastal flood defences will continue to be maintained, are an important area for consideration. The change in policy means that for some people their defences will not be maintained resulting in a lower level of defence (Defra 2004). The potential governance issues in implementing such policies were highlighted in the thesis as an important element of consideration (see chapters six and seven). It is, as noted, debateable whether such a shift in approach is the best option, with interviewees in the study highlighting concerns about such a change. A critical sociological understanding of risk assessment and cost-benefit analysis, as bases for decision-making, reveals the subjectivities inherent in such methodologies and calls into question the legitimacy of arguments for such an approach. However, in the event of implementation the importance of dialogue, compensation and other measures to lessen the impact on those people affected has already been demonstrated (see Milligan et al 2006). Such measures can be seen to play a significant role in tempering people's perception of the risk they face, reducing uncertainties, and thus the impact of these changes on communities.

In cases where the decision has been taken to discontinue funding of a community's flood defences, important questions arise regarding the extent to which such an approach can be regarded as 'sustainable' without the provision of compensatory measures. From these final thoughts, it is concluded that if 'sustainability' is to be integral to our planning and management strategies in relation to floods, there is a need to find ways to eliminate the potential for 'winners and losers' that the shift in policy approach creates. To this end, it is concluded that creating spaces within and between institutions to facilitate flexibility in decision-making and dialogue with public(s) will be of great significance. The coming years will be an important time for learning, reflection and (re)assessment, as the implementation of changes in policy unfolds.

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## Appendix: Interview Schedule

Do you object to this interview being recorded?

Before we start I just need to confirm that you consent to this interview and inform you that any information you give will be treated as confidential and made anonymous.

This interview is intended to me more like a guided conversation so all the questions I'm going to ask are open ended.

\*\*\*\*\*

**What is your name?**

**What is your job title?**

\*\*\*\*\*

- 1. Firstly, how would you describe your role in relation to the issue of flooding?**
- 2. What in your view are the major issues that have implications with regard to flooding in contemporary England and Wales?**
- 3. What in your professional view is the dominant approach currently adopted towards flooding in contemporary England and Wales?**
- 4. Do you feel this is the most appropriate approach to be taken?**
- 5. What from your perspective are the factors [if any] that act as a barrier to our capacity to deal with flooding in contemporary society?**
- 6. In your view where and how does the related issue of climate change feature in the discussion and approach(es) towards flooding?**

### **Relationships and Interactions with Others**

- 8. From your perspective, which are the most important groups, agencies and people involved in the process of addressing flooding in England and Wales?**
- 9. Which groups/agencies/people do you or have you worked with?**

**10. Could you give me examples of when you have worked with these agencies or groups (describe the relationship and your role)? Could you describe the process that you went through on one of the occasions when you worked with one or more of these agencies?**

**11. Do you have any memories of when collaborations have worked particularly well? Could you describe one of these occasions?**

**12. Do you have any memories of conflicts of interest (or ideas) between yourself and the other agencies you have worked with? Do you have any memories of how these were resolved?**

### **Policy and Other Reports**

**13. What are your views on the final draft of the Foresight report on Future Flooding?**

**14. What do you feel the impact of the report has been on practice?**

**15. What are your views on the new government strategy *Making Space for Water*?**

Prompts: Do you feel it's a positive response to the issues? Are there positive and negative aspects of the proposals? Are there areas that remain unaddressed by the policy?

**That's the end of the questions that outlined for this interview. Is there anything more that you feel would be relevant to the project that you could tell me?**

Thank you very much for your time.

## Appendix: Letter/Email to Participants

This letter was printed on Cardiff University headed paper.



Dear.....,

I'm an ESRC doctoral student at Cardiff University examining how knowledge translates into practice in Britain with regard to the issue of flooding. The primary aim of the project is to gain an understanding of the experiences and views of groups, agencies and people with professional involvement in the issue of flooding.

As a key figure in this area your views would be invaluable to this project and I would be grateful if you would undertake an interview of approximately 60 minutes. I hope that you will be able to participate in this study as your insights would make an important contribution to this research. The data will be used to produce the thesis, presentations, conference papers, and academic publications. The interview can be conducted via the telephone or face to face at a time and date that is convenient for you. Interviews are usually recorded.

If you wish to discuss any aspect of the project further before agreeing to an interview please contact me and I will be happy to respond to any queries you may have.

Thanking you in anticipation.

Yours Sincerely

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