



AL AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AN
AL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AND POLITICAL DY
F FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AND POLITICAL DYNAMICS OF FLO
RECOVERY AND RESPONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD RISK, RECO
AL AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AN
TICAL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AND POLITICAL
FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AND POLITICAL DYNAMICS OF FLOO
VERY AND RESPONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY
ONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE
AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AND
DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AND POLITICAL DYNA
LOOD RISK, RECOVERY AND RESPONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD
VERY AND RESPONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY
ONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE
AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AND
DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE SOCIAL AND POLITICAL DYNA
LOOD RISK, RECOVERY AND RESPONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD
VERY AND RESPONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY
ONSE SOCIAL AND POLITICAL DYNAMICS OF FLOOD RISK, RECOVERY AND RESPONSE

Social and Political Dynamics of Flood Risk, Recovery and Response: A Report on the Findings of the Winter Floods Project

Catherine Butler

Kate Walker-Springett

Neil Adger

Louisa Evans

Saffron O'Neill

This report should be cited as: Butler, C., Walker-Springett, K., Adger, W. N., Evans, L. & O'Neill, S. 2016. Social and political dynamics of flood risk, recovery and response, The University of Exeter, Exeter.

Acknowledgements:

We acknowledge funding from the UK Economic and Social Research Council [Grant: ES/M006867/1]. We further acknowledge funding from the National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Environmental Change and Health at the London School of Hygiene and Tropical Medicine in partnership with Public Health England (PHE), and in collaboration with the University of Exeter, University College London, and the Met Office.

The authors wish to thank the members of the public and the stakeholders that participated in the research.

Further information about the study can be obtained by contacting:

Dr Catherine Butler (c.butler@exeter.ac.uk)

Dr Kate Walker-Springett (k.walker-springett@exeter.ac.uk)

ISBN 978-902746-35-0



CONTENTS

SECTION	PAGE
Executive Summary	2
Introduction	6
Research Methods	8
Findings	11
THEME 1: PERCEPTIONS OF FLOOD CAUSES AND SOLUTIONS	11
1.1 Perceptions and Experiences of the Causes of Floods	12
1.2 Perceptions of Solutions and Flood Management Options	15
1.3 Implications: Explaining Contestation and Building Trust	18
THEME 2: POLITICS, EXPECTATIONS, AND INSTITUTIONAL RESPONSES	19
2.1 Expectations and Perceptions of Responses	20
2.2 Scales of Response, Responsibilities, and Governance	22
2.3 Politics and Institutions	25
2.4 Implications: Addressing Expectations and Politics in Flood Management	26
THEME 3: PLACE AND SITUATED PERCEPTIONS	27
3.1 The Influence of Place on Perceptions of Causes and Solutions	28
3.2 Politics, Place and Responses	29
3.3 Landscape, Homes and Futures	30
3.4 Implications: The Importance of Place in Flood Response and Recovery	32
THEME 4: FLOOD EXPERIENCES, COMMUNITY RESILIENCE AND WELL-BEING	33
4.1 Social Resilience	33
4.2 Well-being and Mental Health	36
4.3 Implications: Well-being in the Aftermath of Floods	38
Conclusions	39
References	44

Executive Summary

This report sets out key insights and findings from a major research project focussed on the social and political dynamics of flood events. The research sought to understand the evolution of responses to floods in the aftermath of a major event and the implications for longer-term flood management. The project examined perceptions and experiences of members of the public affected by flooding and those with professional responsibility for flood risk management, policy, and practice ('stakeholders').

Current policy debates in the UK highlight distinctive challenges in responding to floods, given expectations for increases in their severity and frequency with climate change. Over five million homes and businesses are subject to flood risk in the UK (Environment Agency, 2014) and recent major floods in 2013/14 and 2015/16 have resulted in extensive damage to private property and public infrastructure with many millions of pounds of economic losses (e.g. Chatterton et al. 2016). Although there has been much previous research on how members of the public are affected by floods and some work to understand perceptions relating to particular dimensions of the issue (such as the link between flooding experience and climate change), we know far less about the range of perspectives on flooding across public and stakeholder groups or how these interact to affect responses and outcomes in the aftermath of major events. Greater understanding of public perceptions and experiences of floods, and how these evolve, will highlight challenges, and also present opportunities, for the delivery of UK flood policy and management strategies.

The research involved three phases of intensive longitudinal empirical research during the year following the UK's 2013/14 flood events (June 2014-June 2015): 1) In-depth qualitative repeat interviews over a one year period with flood affected members of the public (interview n=60) in Somerset (South West England), and with key stakeholders at national and regional levels (interview n= 52); 2) A locally representative survey of 1000 members of the public across two flooded UK regions (Somerset n=500 and Boston, Lincolnshire

n=500, July 2015). 3) Two deliberative workshops, one with flood affected publics and another with key stakeholders (June 2015). This report offers an overview of the key findings from these datasets relating to public and stakeholder experiences and perceptions of flooding after a major flood event.

The research has illuminated a wide range of novel insights on public and stakeholder perceptions regarding: flood policy and public expenditure; perceptions of causes and solutions to flood risk; the underlying factors that influence people's engagement with flood risk management; alternative mechanisms for reducing the impacts of floods; processes of recovery and community resilience; health and well-being impacts associated with flooding; and the political dimensions of decision-making about responses.

KEY FINDINGS

The research reveals important differences in how members of the public and stakeholders understand causes and solutions for flood risk and interpret the appropriateness of responses and responsibilities. This offers new insights into the reasons for contestation following flood events and provides evidence relevant to the development of capacities for future management of flood risk. Specifically, the analysis highlights the importance of more strategic processes for decision-making post-floods in order to reduce contestation and capitalise on the opportunities that flood events present both for public engagement, and for embedding flood resilience and resistance when homes and communities are being rebuilt. The data highlights important differences across places, people, and households in terms of their experiences of flooding that have relevance for the appropriateness of advice, support, and perceptions of responses. Finally, the analysis provides novel understanding of the factors that underpin and influence community resilience in and through flood events and signals the importance of policy mechanisms that support social resilience, for future flood management. The report is structured around four themes.

Perceptions of Flood Causes and Solutions

Members of the public perceive the causes of floods differently to those in institutions and stakeholder organisations. This has important implications for perceptions of the solutions to floods and offers insights relevant to understanding why publics react in the ways that they do following flood events.

The research highlights key differences in the ways in which members of the public and stakeholders frame the causes of flood events, which have direct implications for the perceptions of responses. Although both members of the public and stakeholders agreed that high levels of rainfall contributed to the 2013/14 winter floods, less focus was placed on weather or climate in the public responses. Instead, the public cohort more readily attributed the floods to social actions of institutions and individuals, including river and land maintenance, inappropriate development, specific decisions about water management during the flood event, and longer term prioritisation of other issues by authorities. Variations in perceptions of the causes of flooding underpinned differing views on the solutions. This was particularly noticeable in relation to emotionally charged debates about land and river management decisions. There was, however, pragmatism within the public cohort related to the availability of funding for flood risk management, and what could be realistically achieved under current economic conditions. The contrasts between public and stakeholder perspectives can be seen as central to problems of blame cultures and a diminished quality of public debate about responses to floods. Perceptions of historic flood management decisions, budgetary constraints, and the belief that climate change is utilised an excuse for inaction contribute toward mistrust in authorities and further constrain the nature of the debate. With increasing flood risk and occurrences of flooding these issues are likely to intensify in future if efforts are not made to support the development of lower cost solutions for high-risk communities that do not qualify under current economic assessments for flood defence funding. There is a need for greater dialogue about viable lower cost alternatives for flood management in order to improve the terms of public debate and reduce the tendencies for a blame culture.

Politics, Expectations and Institutional Responses

Differences in expectations with regards to response and recovery processes were evident across public and stakeholder cohorts. The expectations members of the public have pertain to basic underlying rights or ideals about the role that government should play in ensuring the socio-environmental conditions needed to live healthy lives.

The data reveal a mismatch in the expectations of members of the public and the statutory requirements of government bodies with responsibilities for flood risk management. This relates to a lack of clarity about institutional responsibilities and frustrations with the responses to flood events amongst those affected. The result is reduced trust in authorities that can detrimentally impact the relief efforts and in the longer-term has consequences for how effectively communities and agencies can work together to combat future flood risk. Clear written communications that establish what support different key agencies provide for the public in case of a flood event may be beneficial in resolving some of these issues. However, there is a need for tangible responses to floods and communication about the efforts that people affected and authorities will take to diminish the impacts of future events. The ability of different agencies, people and organisations to work together across scales to create solutions was an important concern that arose out of issues public participants and stakeholders saw with current responses and longer-term flood risk management. Such issues pertained to the diminished role of local communities and local knowledge in managing flood risk within affected areas; the funding arrangements for flood management; and the environmental protection functions of the main agency with responsibilities for flood risk. The influence of politics in decision-making about flooding was identified as an issue by both stakeholders and members of the public. The poor quality of political debate and the use of flood events to advance or entrench existing political interests and concerns (e.g. relating to electoral politics and differences between party positions) were identified as strongly influencing responses and decision-making.

The research shows that communities can and do initiate responses following floods, such as enabling travel, particularly to and from the workplace, in clean-up processes, and through supporting health needs. These could be better supported by governing institutions and agencies through greater sensitivity to on-going community-led responses and attentiveness to the importance of community cohesion, for example, in evacuation protocols.

Place and Situated Responses

Perceptions of flood risk and efforts to respond to events are influenced by range of factors that relate to the specifics of different places. These include community relationships, prior flood experience, and place attachment.

The analysis shows how the uniqueness of particular areas and the forms of place attachment that develop are important for understanding public responses to flood risk. This pertains as much to the social and political landscape, current and historic, as the material environment. The attachments that people have to the material environment, as well as the aesthetic and cultural dimensions of the landscape, play a significant role in how people react to flood events throughout the recovery and response process, including attitudes towards building resilience for future flood events. Attachments to place can result in a desire to maintain particular forms of water and landscape and retain traditional practices for flood management. This can conflict with the need to adapt to future flood risk, which is likely to involve significant changes both materially and socially. In terms of political dimensions, public views on responses to floods are linked to perceptions about differences in the ways other areas are treated by authorities and government and this also has implications for public reactions following floods. Re-forging connections with home and place more widely is an important part of recovery processes after flood events with implications for well-being. The findings highlight the importance of being sensitive to the specificities of place in the responses to flooding. However, they also draw attention to how the differential forms of social and economic capital that communities and local authorities or agencies have, can affect their

ability to attract national resources potentially leading to uneven distributions that are not necessarily reflective of need. Attention to the particular characteristics of areas, homes and people thus needs to be part of broader more strategic processes for decision-making and efforts to ensure fair and appropriate distributions of resources. This is suggestive of a need for a flexible approach to assessing options for flood risk management and engaging with communities across different areas. Such an approach would take account of the various place-specific issues that influence perceptions of flood risk and management options, in order to develop responses that do not conflict with existing community relationships, values, and attitudes toward the local area.

Flood Experience, Community Resilience, and Well-being

Social networks and community cohesion are critical in supporting resilience to flood events. The findings suggest that these aspects are currently underemphasised in emergency response and policy strategies when compared to material and infrastructural components of flood resilience.

The research findings provide evidence for the importance of community cohesion and social networks in mitigating negative impacts to well-being during and after flood events. Several dimensions of social resilience are revealed as significant for enhancing the abilities of people to cope and for improving well-being. These include formal and informal modes of support, for example businesses offering services and donating to relief efforts, keep in touch networks, and dinner or other forms of social meetings with friends and others that have been affected. The presence of support workers and volunteers also formed an important part of the social infrastructures relevant to community resilience, for example by signposting people towards more formal types of institutional support or by providing direct personal support at times of high anxiety and stress. People having a sense of agency, including abilities to effect change and engagement with decision-making processes, is also revealed as a significant factor in improving people's well-being in post-flood contexts. Governing institutions can support multiple aspects of

community resilience but can also inadvertently have detrimental impacts on community cohesion and co-operation. The analysis highlights how stress and anxiety owing to floods has wide-ranging social and economic impacts on work, future lives and livelihoods, and social participation that are not easily measurable so could be overlooked. For example, the research shows that many effects are more subtle, frequently not reported, and not characterised by post-traumatic stress disorder, so are not likely to be accounted for within current assessments of flood impacts. There is a need to find means for taking better account of these socio-economic impacts within policy and institutions.

The report offers three overarching key recommendations:

Improving the quality of the public debate in post-flood contexts: Flood events present opportunities for engagement between members of the public that have been affected by flooding and decision-makers within institutions. These are moments in which new groups and networks are formed and people seek to connect with governmental organisations. Equally, they represent times when there are high levels of institutional communication and action, though public meetings and other types of formal and informal engagement. At present, the opportunities that this might afford for more collaborative processes of response are diminished by the poor quality of political debate and public rows that surround flood events, and a lack of clarity about what people can expect in the aftermath of events from authorities or what they can do themselves. **There is a need to improve the quality of the political debate in the aftermath of floods and work to ensure that expectations are negotiated between and across communities affected and institutions with responsibilities.**

Supporting social resilience and recognising community responses: Floods have significant negative impacts on well-being and conventional approaches to assessment and measurement pertaining to policy responses limit abilities to take account of these and to

effectively respond. Given this, social and community resilience may be underestimated in terms of its role in enabling people to cope and recover from floods, and in mitigating negative implications for well-being. Greater support should be given to mechanisms and policies that aim to enhance social and community forms of resilience. Specific recommendations arising from the research include the importance of increasing the use of professionalised community coordinator roles (such as village agents in rural contexts) that can form a link and source of two-way exchange between agencies, responders, governing bodies, and communities. Individuals working in community support roles provide an important mechanism during emergency and post-flood contexts but also have roles in generating community resilience outside of these times. **There is a role for institutions in ensuring social infrastructures are in place that can effectively support the emergence and maintenance of social resilience.**

Taking a strategic approach to financing and embedding resilience and resistance in response and recovery: Emergency funds and their allocation at times of intense pressure and stress following floods can contribute toward short-term decision-making and a lack of strategic direction. Processes for allocating funding at these times should be better formalised so that communities, local authorities, and agencies can know with greater clarity what opportunities are available for additional funding allocations following major events. This is to recognise that severe floods are likely to happen more frequently and enable a greater degree of strategic oversight in the decision-making and funding allocations that are made. Consideration should be given as to how government initiatives (such as the flood mitigation fund) could work in concert with insurance industry protocols, for example loss adjusters assessing for property level resilience and resistance measures as part of the insurance claims processes. **There is a need to embed more strategic processes for decision-making about funding and resilient rebuilding in post-flood contexts to facilitate responses that will reduce the impacts of flood events in future.**

Introduction

Recent years have seen several episodes of widespread and high profile floods across the UK with significant social, environmental and economic impacts. In this context, floods have come to represent an increasingly pressing policy issue that is recognised as entailing complex challenges (e.g. see The Pitt Review, 2008). Such challenges concern the need to address the immediate effects of floods (e.g. through insurance, recovery support, and emergency services), while tackling multiple longer-term national policy goals that relate to flood risk, such as climate change adaptation, land-use policy, agriculture, and wider sustainability (DEFRA, 2014). Understanding public and stakeholder perceptions and experiences of flooding will be of critical importance in efforts to develop robust long-term responses to floods owing to a number of linked imperatives.

First, multiple people, from those affected by floods to those working in professional roles, are deeply implicated in the development and deployment of adaptation strategies (Klinsky et al. 2012). As such, the effectiveness of strategies for mitigating and adapting to floods will depend in large part on the public acceptability of and engagement with options (see Adger, 2008).

Second, there is evidence of existing public debate and conflict around proposed strategies (such as structural and natural modes of flood risk management, river and land management, resettlement, managed realignment, and others), meaning that engagement with public and stakeholder perspectives is likely to be crucial in avoiding exacerbation of such conflicts (Butler and Pidgeon, 2011). Finally, echoing the conceptual and empirical arguments in support of greater public engagement that have occurred in science and technology studies (see for example, Wynne, 1992; Leach et al., 2005), it has been asserted that it is vital to engage with publics on major socio-environmental issues as they 'bring novel information or perspectives into the discussion' (Klinsky et al., 2012: 863). Indeed, it has been suggested that in contexts where only a narrow range of possible perspectives are taken into account, analyses and responses are constrained from the outset and the ability to produce robust policy responses reduced. It is therefore recognised that building understanding of and working to minimise the narrowing and marginalisation of different viewpoints is important for the resolution of contested policy issues (Leach et al. 2010; Adger et al. 2013). These imperatives signal the significance and timeliness of research that reveals the meanings, associations, and experiences of different people and groups in contexts of flood risk.



Building from these concerns the project had the following objectives:

- To build insight into how members of the public and stakeholders understand floods and their solutions in the aftermath of major events
- To interrogate how different perceptions, social processes and experiences affect the longer-term responses to floods and related issues
- To investigate how different experiences and perceptions of responses to floods relate to wider issues of well-being
- To identify to what extent existing strategies and approaches to flood risk management (such as individual and community resistance and resilience) help to mitigate impacts

This report reveals the multifaceted relationships between perceptions of causes, proposed solutions and expectations of responsibility that underpin the responses of members of the public and those with professional responsibility for flood risk management ('stakeholders') at regional and national scales. The report is organised into four themes that cover the main findings arising from the study:

THEME 1

Perceptions of Flood Causes and Solutions

This theme discusses how the causes of flood events are evaluated and prioritised by members of the public and stakeholders, and how the framing of causes relates to the types of solutions that are proposed and enacted.

THEME 2

Politics, Expectations and Institutional Responses

Theme two discusses the links between public expectations of institutional responses to flooding and stakeholder positions on their obligations, responsibilities, and capacities, dissecting the implications of differences between stakeholder and public attributions of responsibility.

THEME 3

Place and Situated Perceptions

This third theme examines the role of place in shaping responses to flood events and details how situated perceptions influence attitudes towards future flood risk management approaches.

THEME 4

Flood Experiences, Community Resilience and Well-being

Theme four presents findings pertaining to the consequences of flooding for well-being and considers how aspects community and individual resilience and institutional responses collectively determine well-being impacts.

Research Methods

The analysis presented here provides a comprehensive account of the perceptions and experiences of a broad range of individuals either working within the flood risk management sector or affected by flooding during the winter of 2013/14.

The objectives of this project have been investigated through three interlinked research phases: longitudinal semi-structured interviews with regional and national stakeholders within flood risk management roles and member of the public affected by floods (interview n=112); a telephone survey of members of the public living across two flood affected areas (participant n=1,000); and deliberative workshops with flood professionals and members of the public (participant n=32). This report provides a synthesis analysis of these datasets, presenting key messages that have been derived from examining the different data streams as a whole.

Specific details pertaining to each phase are given in figure 1, and in-depth methodological details for all phases of the project can be found in Supplementary Materials on the project website (geography.exeter.ac.uk/winterfloods). Details pertaining to the study areas can be found in Box A: Case Study Sites on page 10.

This report provides a synthesis of both the qualitative and quantitative phases of the research, allowing conclusions to be drawn about how people experience and perceive floods and importantly, why they respond in the ways that they do.

It provides insight into the key differences and similarities between those with a professional role in managing flood risk ('stakeholders') and those who experience the disruption that flood events have on daily lives ('public'). We utilise the terms 'stakeholders' and 'public' throughout the report to refer to these two cohorts of participants that are differentiated according to their experiences of flooding (i.e. either responding in a professional capacity or directly affected).

We also make use of the term institutions or authorities interchangeably to denote organisations that have a role in responding to flood risk (e.g. the Environment Agency, Local and National Government, Non-governmental Organisations). All interviewees were guaranteed anonymity as part of the research. As such generic numerical identifiers are used to differentiate between interviewees across public and stakeholders cohorts. Though we cannot provide a full list of organisations involved owing to confidentiality, interviewees were from a range of national and local government, government agencies, non-governmental organisations and charities, and bodies representing different sectors such as agriculture, insurance, and engineering.

Statistics and quotations have been used to illustrate key points and have been taken from the survey and qualitative interviews respectively.

Figure 1: Overview of methodological processes

PHASE ONE:

In-depth Longitudinal Interviews with Stakeholders and Members of the Public

Repeat interviews with members of the public living in Somerset (n=60) and stakeholders with a professional interest or responsibility for flood risk management across local, regional and national scales (n=52).

Themes discussed included the causes and solutions to flood events in 2013/14, the impacts on well-being of flood events, and the role of individuals and institutions in reducing future flood risk.

Initial interviews were held in July-October 2014 and repeated in April-May 2015 to explore how perceptions, experiences and processes of response evolve over time.

PHASE TWO:

Telephone Survey (n= 1,000)

This phase explored the saliency of the themes arising from the interviews across a broader population of people in regions affected by the 2013/14 winter floods.

The survey sampled from the UK counties of Somerset and Lincolnshire; topics included views on the causes of floods, the acceptability of flood risk reduction schemes, and a quantitative assessment of how well-being is affected by flooding and the subsequent recovery period.

PHASE THREE:

Deliberative Workshops with Stakeholders and Members of the Public

Two deliberative workshops were held with participants from the stakeholder and public interview cohorts (n=32).

The workshops were designed to explore some of the initial findings from the project. The format of the workshops encouraged participants to comment on the major themes arising from the interviews and reflect on future flood risk management.



BOX A:

Case Study Sites

The county of Somerset in the south-west of England and the town of Boston, in Lincolnshire in mid-east England both experienced severe flooding during the winter of 2014/15, which saw extremely high rainfall across the UK.

In Somerset, the flooding was concentrated within the Somerset Levels and Moors (SLM), a low-lying flat area that covers approximately 650 km², which includes 249 km² of farmland and 529,972 residents (as of April 2011). The area has been extensively drained since the Industrial Revolution to facilitate agriculture in the area. Water levels in the rivers and drainage ditches are intensively managed throughout the year to support both biodiversity and the agricultural industry. During the wetter winter months, the unpopulated Moors are used as water storage areas when rainfall exceeds the carrying capacity of the rivers. The continuous rainfall throughout 2013/14 exceeded the storage capacity of the Moors and the carrying capacity of the river network and approximately 280 homes and 65km² of land flooded (Environment Agency, 2015), some of which remained under water for upwards of 12 weeks.

Lincolnshire, a county on the east coast of England, has extensive sea defences to protect its 350km² hectares of farmland, 713,653 residents (as of 2011), and the tourism industry, which is of high regional importance. The town of Boston is situated in a low-lying fenland area at the southern end of Lincolnshire, much of which is below mean high water spring tide levels. In December 2013 a tidal surge occurred as the water levels in the river Haven rose and began to overtop flood defences, continuing to do so until the water levels dropped an hour later. In total 688 homes and 115 businesses were inundated with water but emergency services had been preparing to evacuate 18,000 residents.

FINDINGS

Understanding Responses to Floods: Publics, Policy, and Process

THEME ONE: Perceptions of Flood Causes and Solutions

HIGHLIGHTS

- Members of the public perceive the causes of floods differently to those in institutions and other stakeholder organisations. This has important implications for perceptions of the responses to floods and offers insights relevant to understanding why publics react in the ways that they do following events.
- Differences between public and stakeholder perspectives can be seen as central to problems of blame cultures and a diminished quality of public debate about responses to floods. Efforts to be more explicit about and reconcile contrasting perspectives are likely to be important in the development of long-term robust solutions to floods.
- There is a need for greater dialogue about viable alternatives to intensive river management and structural flood defence in order to improve the terms of public debate and reduce the tendencies for a blame culture, particularly in areas where it is uneconomic for national bodies to provide flood management.
- Perceptions and memories of historic land and river management practices influence current and future expectations, and may limit adaptation capacity in areas that are likely to see increases in the magnitude and frequency of flood events.

SUMMARY

Several clear differences in terms of perceptions of the causes of floods and expectations with regards to institutional responses were identifiable across the stakeholder and public participants. First, although both members of the public and stakeholders agreed that high levels of rainfall contributed to the winter

floods, less focus was placed on weather or climate in the public responses. Instead, the public cohort more readily attributed the flood event to social actions of institutions and individuals, including river and land maintenance, inappropriate development, specific decisions about water management during the flood event, and longer term prioritisation of issues by authorities. Secondly, these variations in perceptions of the causes of flooding underpinned differing views on the solutions to floods. This was particularly noticeable in relation to emotionally charged debates about land and river management decisions. There was, however, pragmatism within the public cohort related to the availability of funding for flood risk management, and what could be realistically achieved under current conditions. Finally, differences between stakeholder and public views on solutions exist when long-term futures are considered. Future perspectives exposed key differences between the public and stakeholders about what is considered realistic in terms of responsibilities for authorities and individual householders or communities. Differences also exist in the extent to which climate change was integrated into discussions about future solutions. These contrasts between public and stakeholder perspectives can be seen as central to problems of blame cultures and a diminished quality of public debate about responses to floods. Efforts to be more explicit about and reconcile contrasting perspectives are likely to be important in the development of long-term robust solutions to floods. This is suggested to be more attainable at local and regional scales but would need to remain connected to national decision-making. Social infrastructures, such as flood action groups and community workers, are important in forging connections between institutions and members of the public.

RESULTS AND EVIDENCE

1.1 Perceptions and Experiences of the Causes of Floods

There was a high degree of consensus around the relationship between climate change, increased rainfall, and the 2013/14 flood events. In terms of causes of UK floods, 18% of survey participants selected climate change, 11% selected the extent and duration of rainfall, and both these factors were raised by public and stakeholder participants within the interviews. However, the public cohort also perceived expert knowledge relating to climate change as a political device that was used to facilitate transfers of responsibility or to suggest that citizens should have been better prepared. In this way climate change was viewed as being part of institutional narratives that diminished people's ability to call for tangible actions to achieve real reductions in flood risk.

“ Well, I'd be a twit if I said there's no change but I think that could have been managed had the environment been managed... they've known for a long time what's happening but they've never done anything here.

Public 15

Differences between public and stakeholder perspectives were most evident in the degree of emphasis placed on the actions of institutions and individuals. The public cohort placed far greater emphasis on issues such as river and land maintenance, inappropriate development, specific decisions about water management during the flood event, and longer term prioritisation of issues by authorities. The survey results show that respondents most frequently chose the three land management choices as causes of UK floods. Considering the four options relating to land and river management causes together, lack of river maintenance was selected as a cause of floods by a higher proportion of respondents than the other three options (i.e. agricultural land management decisions, building on flood plains, and the management of land for biodiversity goals and not human needs) (see Figure 2).

The survey results show that 41% of respondents selected land and river management options as a cause of UK floods compared to only 11% selecting rainfall.

“

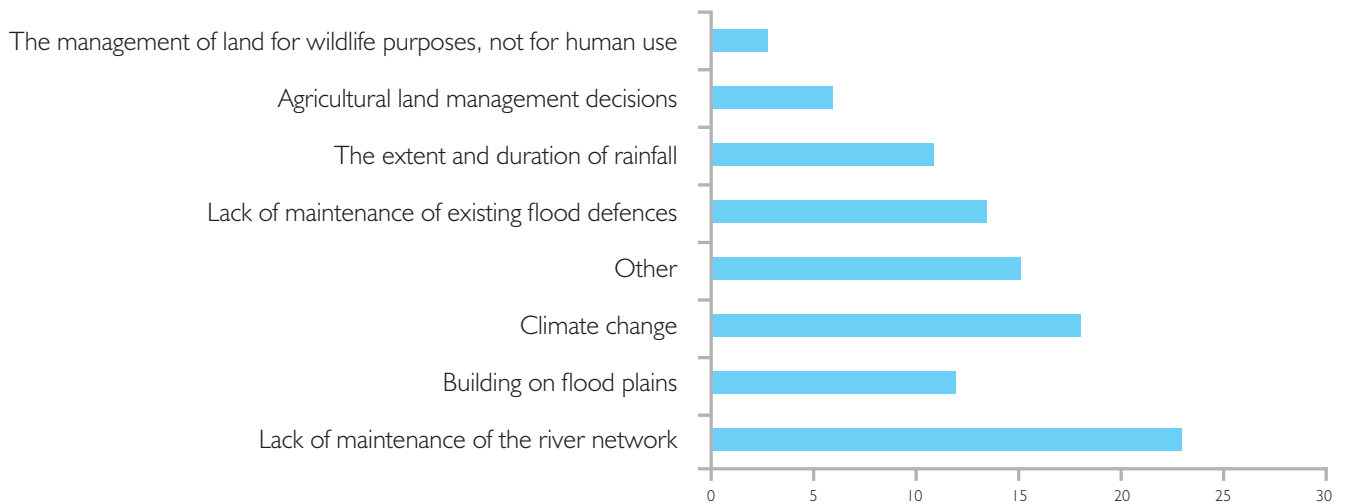
Interviewer: What are your views on climate change?

Public 27a: I think it's a very, very easy way to blame things on that [climate change] so that you don't need to ... explain yourselves... You're 'We couldn't have accounted for that because of climate change'

Public 27b: It's their Get Out Of Jail Free card.

”

Figure 2: Results from the survey question: What do you believe to be the causes of floods in the UK?



The public interviews involved multiple narratives about the causes of floods that attributed them to institutional decision-making. Key narratives related to: a lack of river dredging and maintenance of channels; decisions by authorities to create artificially high water levels; particular forms of farming and agricultural practice; and inappropriate development. River dredging narratives were related to the cessation of such processes by agencies as a consequence of policy decisions pertaining to environmental degradation, and budget restrictions. The decision to stop dredging was perceived as being in opposition to local knowledge and expertise, and the Environment Agency were viewed by some as being

more concerned with the environment than for those at risk from flooding.

In the stakeholder cohort, whilst dredging was acknowledged as being one method to reduce flood extent and duration, the majority of stakeholders were clear that the extra capacity provided by dredging would be small in comparison to the amount of rainfall during the winter of 2013/14. Stakeholders also referenced the challenges associated with funding and justifying public expenditure on maintenance where gains are expected to be temporary and relatively limited.

“ This land has been managed since Roman times, and since the founding, the inauguration or whatever it is of the Environment Agency, it's just stopped. Nobody voted for it being stopped, it was very undemocratic. Nobody said, "Okay well we'll stop," they just took it upon themselves to not do it. Whereas for years and years it had been done, it was very undemocratic.

Public 4

“ It's absolutely clear to anybody that when you've got a bridge like that with a flow going through, there were two relief holes each side, in the 1960s you could see those and water flowing through them, in the latest photograph, there's a little bit in the middle, then mud and you can't even see the holes at the side. That's the problem.

Public 17

Narratives associated with land management decisions were discussed by both the public and stakeholders as causes of the 2013/14 floods but were viewed as connected to different underlying issues. The land management issues raised by members of the public related to reduced infiltration rates (e.g. artificially high water levels in winter to encourage grass growth), increased erosion rates (e.g. maize farming in the upper catchment), and diminished pumping capacities. Stakeholder participants linked problematic land management choices to a combination of farming subsidies and conservation incentives (e.g. land stewardship schemes), whilst public participants focused more on the responsibilities of riparian land-owners (e.g. for ditch clearances) that were believed to have been neglected.

Development narratives were highlighted by many public participants and concerned the role of increased urbanisation as a cause of the floods. This view contrasted with some stakeholder's perspectives who suggested that though development was a contributing factor to flooding at a national level, in the Somerset catchment in particular, the proportion of urbanised land was too small to contribute to flood risk. Overall then contrasts were evident between the public and stakeholder cohorts in terms of how the causes of flooding were positioned, with less emphasis on specific decisions and actions of particular individuals or groups amongst stakeholders.

Focusing on causes where it was possible to attribute fault can be seen as representing a socially important mechanism for ensuring a case for action. Though climate change could equally be mobilised as a narrative for long-term action and investment, it was more often perceived as being situated by stakeholders as an opposing discourse to public calls for institutional action. The emphasis placed on levels of rainfall was also a source of frustration as it was perceived as a narrative that obscured human agency and responsibility.

“ *There's a need to take a very long term and strategic look at land use and land management in the context of both existing and future flood risk, in the context of climate change as well.*

Stakeholder 1

In the stakeholder cohort, there was a perception that climate change was not given enough prominence as a factor contributing to the 2013/14 floods, by comparison to funding and river maintenance activities. Climate change was also discussed by stakeholders who described it as a difficult subject to broach in the aftermath of floods as it brings into view more politically and socially intractable questions about how to deal with flooding in the long-term. Climate change is undoubtedly an important dimension of the debates about flooding, its causes and solutions. By virtue of the way it is positioned and discursively narrated, however, both in and outside of times of flood, it comes to be somewhat taboo and generative of conflict, rather than being a source of open conversations about adaptation and change.

Though there were instances in the research where climate change could be seen to generate conversations and ideals about how things could be different (for example, ideas associated with catchment management, novel agricultural ideas for reducing flood risk, and more radical changes to housing such as building on raised platforms), these remained quite disjointed and were not reflected in the actions that were ultimately taken in the areas that were the focus of this research. Rather, responses were dominated by notions of resilience as bounce back and return to normal, and involved reviving processes of river dredging along with more conventional structural forms of defence.

“ *Interviewer: What's your sense of how far climate change was something that was integral to the debate [about catchment management] early on and going forward now?*

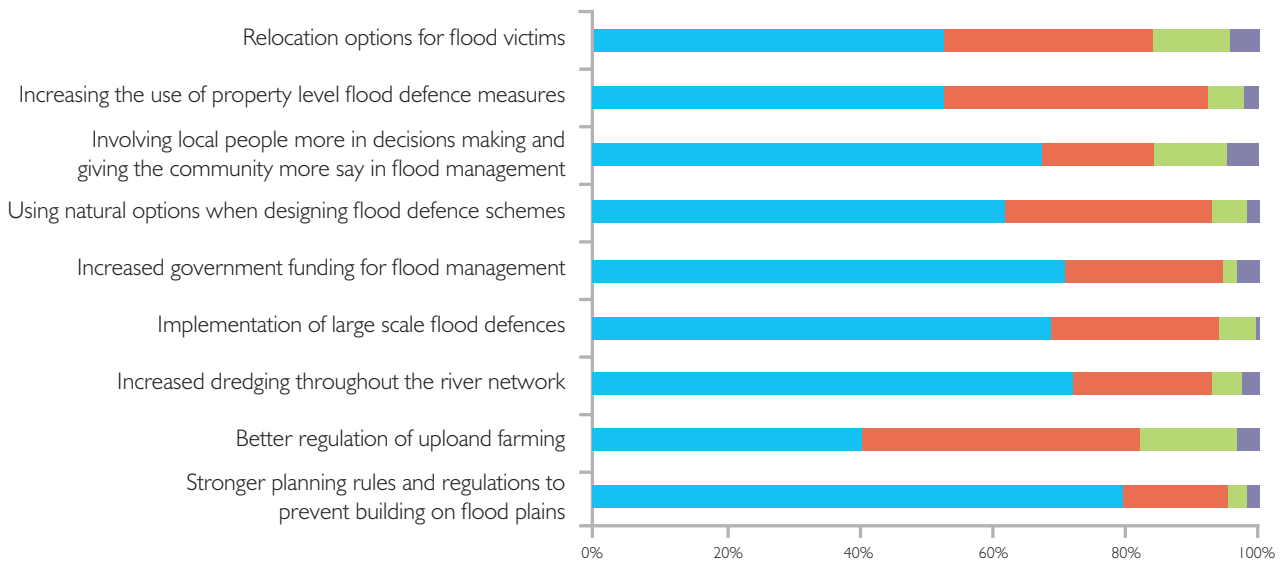
Stakeholder 4: Well it was hardly mentioned at all.

1.2 Perceptions of Solutions and Flood Management Options

It is perhaps unsurprising given the focus of public narratives and perceptions of the causes of floods, that emphasis regarding the solutions to flooding concerned tangible direct actions such as flood defences or river maintenance that could be enacted by institutions. Key dimensions of such solutions included long-term dredging to minimise siltation of river channels, upland management and flood mitigation schemes, maintenance of existing assets, and the need to have the infrastructure in place to deal with large-scale flood events in the future, for example having sufficient working pumps installed, raised roads, and flood barriers. In the quantitative work,

97% of respondents thought that stronger planning rules and regulations to prevent building on flood plains were fairly important or very important in reducing flood risk in the UK. 96% of respondents believed that dredging river channels was very important or fairly important for flood risk management. Large-scale flood defences were perceived as an important solution too, with 97% of respondents believing these to be very important or fairly important. However, 96% of respondents also felt that using natural options were very important or fairly important to consider when designing flood defence schemes (see figure 3).

Figure 3: Responses to the survey questions concerning solutions to flooding in the UK, showing regional totals and overall total for comparison.



BLUE very important **RED** fairly important **GREEN** not very important **PURPLE** not at all important

Stakeholders too expressed the need for on-going river maintenance and flood defence schemes but also spoke about limits of such approaches and the importance of communicating alternative options if schemes and

defences were not economically viable for some communities. This aligned with a greater emphasis in stakeholder narratives on individual householder responsibilities and property level resilience and resistance.

“ *In the past land management was always seen as not a really important activity. But I think what we found with these floods is that... We've probably built all the flood defences that there are to be built in the country, there's not much room left for any more walls or storage areas. But maybe we need to look at how we manage farms and rural locations in a different way.*

Stakeholder 11

Resilience narratives were generally focussed on individual contributions and actions (as opposed to community resilience - see theme 4), with suggestions that householders in flood risk areas should accept a level of responsibility for protecting their homes. Moreover, stakeholders frequently stressed the importance of adaptation and of the public accepting that increased flood risk is going to be part of the future. This was not dissimilar to public responses in that there was recognition of the role for householders in protecting their homes (75% agree or strongly agree). However, the results also show high percentages (88%) of respondents agreeing that government is responsible for protecting people from future flood events. Together, these results highlight another source of potential contestation arising after flood events. Although public participants recognised they have a role in protecting their properties, they were acutely aware of the limitations of property level flood resilience options from their experience of flood events. The available funding for property level flood mitigation measures following the 2013/14 flood events was taken up by many participants but there was a sense that the efficacy of such measures was limited given the nature of the flooding and the types of housing stock in the area, i.e. the flood waters being in houses for extended periods of up to four weeks and many homes being listed buildings that have complicated structures not amenable to resistance and resilience measures – see Box B: Resistance and Resilience Measures in the Home.

75% of survey respondents agree or strongly agree that individuals should be prepared to contribute towards protecting their homes from flooding, but 88% of respondents also agreed or strongly agreed that the government is responsible for protecting us from future flood events.

“ *Lessons learned? I learned that water is very hard stuff to keep back... a property like this there's nothing I can do to keep the water back, so if the flood defence bank fails then I'm stuffed, that's what I've learned. Mud walls, floorboards on top of joists with a void beneath them so the water's just going to come up through, it's going to be everywhere... I've learned of what happens with flood water in this house, and indeed by inference what would happen at other properties, so if I ever again find myself in a property threatened by floodwater I have a much better idea of what to do. Most of which is get out 'cos there ain't nothing you can do about it!*

PUBLIC 26

These differences in the narratives that were emphasised across public and stakeholder cohorts give some insight into the reasons for contestation in post-flood contexts. However, lines of agreement were also traceable through the analysis, with catchment management solutions and funding challenges forming a consistent theme amongst stakeholders and publics alike. Holistic approaches to catchment management, particularly the need to better manage the terrestrial aspect of river catchments to slow the flow of water and minimise erosion, were highlighted as important within both cohorts.

The focus here was on the need for large scale adaptation measures to be put in place, for example flood resistant grasses, land trusts to provide farmers with the capital to invest in resilience measures, and networks where farmers and communities can share best practise in terms of flood recovery. Many of the ideas stressed the role that the agricultural sector has to play in this, whilst also appreciating the need to compensate farmers if they are expected to allow their land to flood to protect homes.

BOX B: Resistance and Resilience Measures in the Home

A major component of policies concerned with reducing the impacts of flooding is the installation of property level resistance and resilience measures (also known as property level protection PLP). Funding for both individual and community level resistance and resilience measures has been offered by the UK government since 2014. On the whole the research suggests that this move to incentivise PLP has been effective in promoting reflection on property level resistance and resilience measures amongst householders. However, there are also instances when PLP is not appropriate or would be ineffective, for example PLP is not effective for all building types (e.g. in buildings of traditional construction, such as cob houses) or for flood events where the water is deep and areas remain inundated for long periods. The research found many examples where PLP measures would have been ineffective as result of the duration and depth of the flooding that occurred in the winter of 2013/14 and the types of houses that were affected. In instances where PLP could be an effective tool against flooding, insurers do not incentivise homeowners to install appropriate PLP measures, which can be as simple as water resilient floor coverings, as part of the rebuilding process. Homeowners are currently managing the process of researching and having their properties surveyed for PLP separately from the insurance process. It would be more beneficial for insurers to prioritise and support the inclusion of PLP in homes where these are appropriate. Stakeholders reflected that PLP installation as part of the rebuild process could reduce insurance claims in the case of future flood events.

The importance of long term, secure and sustainable funding options were seen by all as a key component in reducing flood risk. Public participants were cognisant of funding limitations even while ascribing blame to governmental institutions for the lack of management processes. Throughout the discourse about funding, there was an element of pragmatism concerning where money was spent and whether it was morally right to spend large amounts on protecting small numbers of properties.

“ *...but I think how much investment and public money should go into a relatively small group of people?* ”

Public 2a

The development of a strategy for long-term funding was seen as a key solution to reducing flood risk, by members of the public. Similar themes were present in conversations with stakeholders around funding, for example the need for certainty of funding that extends beyond twelve month periods in order to plan appropriately. This manifested in narratives about the devolution of some aspects of flood defence financing to more local levels relative to national level funding mechanisms.



“ *...with spend on flood risk management, certainly in real terms, dropping up until the winter when there were top ups provided, there's a real concern that quite important maintenance services as well as kind of back room services such as flood warning systems, will not receive the level of investment that's required to maintain them adequately, at the expense of pushing forward capital schemes.* ”

Stakeholder I

For public participants, the quantitative results show that levels of agreement and disagreement about local taxation funding flood defence works were evenly split with 44% agreeing and 46% disagreeing that money should be raised through local taxation to fund flood defence works in the area. Consistent with this, we found that 93% of respondents agreed or strongly agreed that the national government should fund any major flood defence works. Moreover, 97% of respondents thought that increasing funding from national government for flood management was very important or fairly important.

“ I think the problem will be that there’s no new funding for the financial year on-going from next year so whatever activity happens after this financial year, as I understand it at the moment, they’re going to have to find it out of their allocated resources.

Public 18



IMPLICATIONS: EXPLAINING CONTESTATION AND BUILDING TRUST

Key differences in the narrative accounts of the public and stakeholder cohorts reflect underlying sources of tension that fuel contestation in post-flood contexts. Centrally, the emphasis placed on factors beyond institutional control (e.g. rainfall, climate) by those in positions of authority is a source of conflict as those affected look for concrete responses and solutions to the problems with which they are directly confronted.

“ The vagaries of the weather and the vagaries of future funding too – that worries me.

Public 4

This, in combination with a lack of available options for many in terms of active and effective responses they themselves can undertake, creates frustrations with the ways in which causes and solutions are represented. Important areas of agreement exist around the need for long-term funding that is not affected by short-term political cycles or institutional bureaucracy and processes of ring-fencing that limit flexibility and possibilities for new approaches. This attitude was consistent across public and stakeholder participants, and reflects the prevalence of funding or lack thereof being perceived as a cause of the 2013/14 floods.

Agreement was also found in relation to a need for more holistic approaches that could benefit whole areas instead of protecting particular areas or housing developments. Finally, climate change was selected as a cause of floods by many participants reflecting willingness by those affected to recognise and engage with the wider issues this presents. This was further evidenced in the qualitative work where we found engagement with the issues surrounding climate change but this was mixed up with concerns about its use as a political device to avoid action and feelings of powerlessness that such narratives evoked. This highlights the importance of aligning climate change narratives of causes of flooding with long-term solutions that work for people now.

THEME TWO: Politics, Expectations, and Institutional Responses

HIGHLIGHTS

- Differences in expectations with regards to response and recovery processes were evident between the public and stakeholder cohorts. Public expectations pertain to basic underlying rights or ideals about the role that government should play in ensuring the socio-environmental conditions needed to live healthy lives.
- Statutory duties under current flood risk management legislation are complex, both for stakeholders and the public, which could partially explain an apparent mismatch in expectations between public and stakeholder cohorts regarding responsibility for flood risk management.
- There is a need for clarity and public dialogue about what members of the public can reasonably expect with regards to flood management and from which organisations.
- Levels of preparedness for the emergency response and recovery processes would benefit from further efforts to ensure that all agencies, communities, industries, and other organisations can work effectively together, incorporating best practice from previous flood events.
- Institutional actions can diminish the effectiveness of community led actions; greater attentiveness to community solutions could help prevent conflict occurring.

SUMMARY

The research shows differences in the ways the stakeholder and public cohorts viewed the responses to the flooding experienced in the winter of 2013/14, across the whole timescale of the floods. Stakeholder participants perceived that the emergency response was effective with a clear command structure but reflect that this structure needed to be in place early on and that there is a need to ensure staff with appropriate skills are placed in the correct positions. Conversely, members of the public perceived authorities as being

less organised, prepared, and effective than expected but reflect that the staff on the ground worked tirelessly and were extremely good. The core differences in the perceptions of the response are linked to underlying expectations regarding what authorities should deliver compared to what responsibilities agencies and organisations are required to meet. In essence, public participants held expectations for protection and help in recovering from floods that were not necessarily reflected in the statutory responsibilities of agencies and authorities. These expectations pertain to basic underlying rights or ideals about the role that government should play in ensuring the socio-environmental conditions needed to live healthy lives. The ability of different agencies, people and organisations to work together across scales to create solutions was an important concern that arose out of issues public participants and stakeholders saw with current responses and longer-term flood risk management. Such issues pertained to the diminished role of local communities and local knowledge in managing flood risk within affected areas; the funding arrangements for flood management works; and the environmental protection functions of the main agency with responsibilities for flood risk. Devolved powers and funding mechanisms were viewed as a possible route to overcoming some of the challenges in current modes of working. A final set of issues addressed in this section pertains to the role of politics in decision-making about flooding. These issues concern: the interactions between communities and government bodies at times of major events and in the longer-term; the role of other major institutions (such as media and insurance industries) in arriving at responses to flooding; and the relative influence of different groups in effecting outcomes.

RESULTS AND EVIDENCE

2.1 Expectations and Perceptions of Responses

In the reflections of both the public and stakeholders about the emergency response and recovery period there is a recurrent theme about preparedness. Whilst participants were clear in articulating the view that the staff on the ground had worked extremely hard, there was the perception from the public that the authorities were caught unawares by the severity of the 2013/14 floods. This resulted in frustration directed towards those authorities that the public expected to have plans in place to deal with such an emergency but were perceived as being disorganised and chaotic.

“ *When it comes to the next layer of civil contingency, personally I'd say it was pretty appalling, I don't recall seeing anyone for several weeks!*

Public 21

“ *Individual responses I'm sure were good in part, I'm sure there were actions taken by various council people which were very important, very helpful but it wasn't a concerted, orchestrated response and that's just unacceptable.*

Public 27b

Stakeholders reflected on two main points regarding preparedness; the first concerned high level considerations about capacities, for example funding constraints and legislative responsibilities that impacted the types of responses that were enacted. The second point related to the operational management of the events as they occurred and challenges that arose for authorities' capacities to respond owing to the complexity of institutional responsibility for different aspects of the response, in combination with the magnitude of the event and lack of previous experience with this scale and duration of flooding. However, stakeholders highlighted that although there were several lessons to be taken away, overall the response had been effective.

“

Interviewer: What was your view then on the response of the various agencies during the floods?

Stakeholder 13: I think it was very good, everybody said the EA did an amazing job, I think it was a very challenging situation but I think the response was very good, if not slightly chaotic but everybody seemed to feel that they'd had... a good amount of help.

”

79% of survey respondents disagree or strongly disagree that the authorities were well prepared for the most recent flooding.

This disjuncture between how public participants saw the response and stakeholder reactions to some extent contributed to negative perceptions of the communications around the flood event.

Though stakeholders understandably wanted to convey to people what was being done in contexts of immense time pressure, members of the public sometimes viewed this with scepticism given the perception that things had been poorly handled or not managed adequately. Some of the more negative perceptions of authorities' responses related, in part, to the circulation of rumours (for example, that some areas were intentionally flooded to protect other more highly populated areas) and beliefs about misinformation in the absence of trust by members of the public in the information they were receiving or simply a lack of communications particularly during the early phase of the flood event.

“ I went to a debriefing event...one of the questions we were asked was “Who was in command?” and everybody on the table, from all walks of volunteering chorused, “Nobody!” We all said it together and then we laughed but actually it’s not funny because we didn’t think anybody was in charge, there didn’t appear to be a command structure and if you’ve got chaos like that.

Public 20

During discussions about lessons learnt within the stakeholder group, several participants spoke about the need to record best practice from the 2013/14 floods to inform future emergency plans. Other ‘lessons learned’ that were frequently mentioned concerned the need to: ensure that members of staff with relevant experience have appropriate roles during the emergency; include aspects of mental health and well-being support for staff and the public over the long-term and ensure that all the relevant authorities work together within a response structure that has been formed early in the emergency. Similar reflections were highlighted during the public interviews, with key issues being identified in the timing of the responses and support. In some cases information and support was perceived as coming too late and no longer being as useful or relevant as it might have been if delivered earlier, or as disrupting existing responses that had been developed in the absence of interventions from authorities. This is indicative of the importance of the timeliness of responses and the need for integration with existing actions and processes adopted by those affected.

“ For three weeks, the kids were being transported on the back of... tractors and it was a pretty makeshift affair. Of course, as soon as you get officialdom involved after 3 ½ weeks, ‘health and safety, you can’t put the kids on the back of the tractor’ and for 3 ½ weeks they haven’t fallen in. I think for the community, people thought ‘oh boy, give us a break’.

Public 18

“ That all arrived, we’d been in this water, no-one had been ill for five, six weeks and then we’d get leaflets telling us how to walk through flood water, it’s like don’t patronise us, fine if that had come the day we flooded, that would have been useful information but not when we’ve been in water for nearly two months.

Public 27a

In the repeat interviews held in 2015, many public participants reflected more positively on responses particularly in terms of the ways that the different agencies and authorities were working together and the efforts that had been put into involving the public more in conversations about flood management.

This chimed with stakeholder accounts of the response process with participants describing how learning developed through the events and new structures and groups were established as time went on to manage different aspects of the issues. The importance of working to embed such learning from the experiences was also reflected across both cohorts.

“ So I think we’ve learned a massive amount but you wouldn’t go and hang somebody over it, quite simply we’ve never had to cope with it before, if we hadn’t learned the lessons, when something happens again, then you can be openly critical but I think the coordination between all of the authorities, obviously improved as time went on but it should have started off better.

Stakeholder 21

Longer term implications stemming from the public's perception of the authorities response to the floods focussed on the need to rebuild trust in abilities to manage a similar situation and to facilitate dialogue with communities to promote resilience measures being taken up and embedded. Public and stakeholder participants also reflected on the need for a planned approach to managing flood events across and within the different agencies, including to ensure the continuation of measures (such as dredging) to minimise the future risk from flooding. Participants also stressed the importance of improved clarity around a perceived conflict within the remit of the Environment Agency between environmental conservation and flood protection.

“ We need to make sure that we continue to engage with communities in a fair and even handed and open basis. That we allow space for community members to come forward and engage and listen, and just keep the dialogue really. I think it's about how we act as officers of a public body we just need to be clear and transparent and be clear about what we can and can't do. I think sometimes that's difficult, but sometimes it's just better to be clear about what you can't do as much as what you can.

Stakeholder 3

“ We meet regularly and we get newsletters about what they're doing about... And we're quite pleased with what they've done, they've worked very hard. As I say that road at the moment has been well raised.

Public 5

“ That has been I think the most significant factor since I saw you last, the completion of the works and in fact the carrying out of the works that were promised because so often in the past, there's been lots of promises and hand wringing, “We'll have to get this right” and it just drifts away doesn't it? It evaporates. And this time, it's really happened and that is quite unusual.

Public 23

2.2 Scales of Response, Responsibilities, and Governance

Despite both stakeholders and the public ultimately seeking solutions in the face of a major socio-environmental problem, the encounters between members of the public and different agencies or groups were often conflictual in nature. This related, in part, to expectations regarding responsibilities and responses, including inabilities to identify which groups or persons were responsible for any given issue, and contrasts between what members of the public expected and what was statutorily required of any given body.

When public participants were asked about who had responsibility for managing UK floods, many of them attributed responsibility to the Environment Agency. A few participants mentioned the County Council and the Internal Drainage Board, but participants reflected that the division of responsibilities between the statutory authorities was unclear and they were unsure of what to do when the flood happened in terms of contacting and liaising with relevant bodies.

70% of survey respondents agree or strongly agree that there are too many agencies with conflicting interests that are responsible for river management.

The complexity of flood risk management responsibility was also articulated in stakeholder interviews where many expressed concern that the public expectation for flood risk management did not match the statutory duties of the authorities. Moreover, the division of responsibility as a result of the Flood and Water Management Act 2010 was perceived by some stakeholders to have made the situation no less complicated and as having led to gaps in the provision of flood risk management in some situations; for example where Lead Local Flood Authorities have not accepted the full range of responsibilities attributed to them.

“ Well, I suppose they'd [the council] probably be the ones doing some day to day stuff [around flood risk management] but you know, Somerset's a bit strange isn't it, it's got like district councils and county councils, there's lots of layers there isn't there? So yes, I don't really know whether it comes from district council, county council, I think it was mostly council but I don't know, it's all lost in layers there isn't it?!

Public 3

The survey showed that participants allocated responsibility to government for future flood defence but also agreed that individual householders have responsibilities (see Theme 1). These findings were reflected in the interviews. Both individual and community responsibility was discussed by public participants. Interviewees recounted frustration at feeling reliant on national bodies to respond to floods, and reflected on the need for more community involvement in decision-making.

A theme present in the public's reflections on the response and recovery phase is the value of community led actions, particularly during the initial response

phase when there was less visible help provided by the authorities. Examples include the use of tractors to transport people through flood waters that were too deep to wade through and to move cars to higher ground; the collection of contact information for evacuated residents and local GP's offering medical care in their own time. The examples of community actions also represent key ways in which the relevant institutions were perceived to have failed to meet the public's expectations about help that should be provided during an emergency. Differences between public's expectations and institutional responsibility and capacity also appear in the stakeholder interviews, both in views expressed about the need to make communities more resilient so that they need less help during a crisis but also about the reality of flood management in the future and what level of protection is viable.

“ I think generally speaking, rural folk and what are rural folk actually is a lot of incomers like me, people are fairly hardy and they have their own workaround but I think something of this magnitude, if a sitting room had flooded for a couple of days with an inch of water, people wouldn't be screaming about it but I think it was the fact that nothing seemed to be happening – and things were getting worse – and nothing seemed to be happening.

Public 18

“ I very much doubt that many people understand that there's no statutory duty to provide any level of flood protection to the public at all. And I think the level of expectation for what the government should be providing, whether that's local or central government, is completely out of step with that reality.

Stakeholder 1

A final issue in the nature and distribution of responsibility concerns the role of the private sector, particularly the insurance industry. In the UK private insurance is the primary mechanism through which members of the public whose land or property has been flooded are able to acquire the financial capital necessary to repair properties. Despite this, the public cohort viewed the role that insurers play in flood risk management activities as relatively small and as only being related to the provision of low cost insurance to those at flood risk. The mechanisms by which insurers assess damage, and repair houses and contents were in the main perceived positively. However, the role that insurers play in flood response does have implications for the approach to repair and replacement with the tendency being toward complete renovation of homes and replacement of goods after floods, rather than 'softer' approaches to drying, repair, and renewal that may take less time and ultimately be less costly.

“ *When the insurance company were going through the stuff and deciding what to throw out they said “That table’s been sat in flood water for two months so better replace that”, I said “it’s a solid oak table, it’s got wet, so it will dry out” they said “the water was contaminated with a bit of oil, you’d better replace it, we’ll pay for the replacement of that”. It turns out it’s a bloody expensive table, I think I got quoted £2700 to replace it!*

Public 26

“ *It would be much more cost effective to pay for resilience, pay for protection, floodgates and whatever it covers and everything else, so it (the insurance company) doesn’t have to keep paying out claims over again in the coming years.*

Stakeholder 4

Looking to the future, increased excesses or being refused insurance were concerns raised by many public participants irrespective of flood experience. For some this in part related to frustrations over the limited extent to which insurers would take into account flood defence works in the area or property level measures that had been installed. There was also a lack of certainty over the future for insurance including references to a new government scheme (Flood Re)¹. The stakeholder participants discussed how Flood Re could hamper change to the system in terms of how flood risk is considered if high risk properties continue to be insured, and that insurance companies should consider funding property level flood resilience measures directly when flood damage claims are made since the insurer would see a return in the investment because homeowners who have flooded are unlikely to move insurance companies. In this way, adaptation to future flood risk could be encouraged by insurance companies mandating certain flood resistance and resilience measures to be installed in houses that have to be renovated after severe flooding.

¹ Flood Re is a not-for-profit and publicly accountable reinsurance company. Flood Re exists to allow UK insurance companies to insure themselves against financial losses due to claims due to flooding. In the case of a claim, the insurer would be able to recover the costs associate with flooding from Flood Re. This allows insurers to offer cover to those at high risk of flooding because the financial cost of claims is covered by Flood Re and not the insurer.

2.3. Politics and Institutions

Both participant cohorts reflected on the clear influence of politics in the decision-making around flood management. Two key political dimensions of flood risk management were discussed. The first concerned the Environment Agency being perceived as a political body by both stakeholders and public participants and a need, expressed by stakeholders, for a water management body that is able to plan strategically irrespective of political interference. This concerned interventions by central government in processes of flood management during the 2013/14 floods and public disputes between the Environment Agency and politicians or government officials in the aftermath affecting responses and capacities. Such disputes and political interventions were discussed in terms of creating artificial time pressures and ultimately affecting the responses and measures that were implemented.

“

Interviewer: What would have happened in an ideal world, if you did have the time?

Stakeholder 6: We would have been able to plan the works a lot better. I wouldn't have had to work every weekend all summer. What would have changed? It might have been a bit cheaper if we'd have had time to do it better, so the resource hasn't been managed as smoothly as we would have liked.

”

“

Politics, everything now is about economy and the environment is seen politically as being... against the economy.

Stakeholder 23

The second political dimension of flood risk management concerned the influence of other bodies and high profile individuals (such as the National Farmers Union, Internal Drainage Boards, the Church, and members of the Royal family and the role of the media, including social media, in affecting decisions, responses and outcomes (see *Box C: Media and Responses to Floods*). In this respect, questions were raised about whose interests were being represented or given greater weight in decision-making processes. Flood events represent moments or windows in which discourse and public debate about flooding and its solutions occur but the heightened and contested nature of such debates reduces the capacities for embedding longer-term thinking and implementing the most appropriate responses.

This highlights a need to be attentive to the political realities of decision-making about flooding and what this means for responses to the issues now and in the future. In particular, the differential abilities of communities and social groups to mobilise and exert influence that can attract resources at times of disaster may both affect the nature of distribution and hinder abilities for long-term planning. At the very least the political aspects of decision-making affect public perceptions of the fairness of flood management decision-making (see *Theme 3*) which previous research has shown has implications for how people perceive their own responsibilities (Adger et al. 2016).



BOX C: Media and Responses to Floods

Both public and stakeholder participants agreed that the use of the media and particularly social media was instrumental in garnering political and financial support in the Somerset case. Funding of £20 million for flood management was allocated to the area from central government outside of normal funding procedures (normally, flood management schemes are required to pass an economic cost-benefit assessment that requires an 8:1 ratio for return benefits). Stakeholders noted that the focus of media attention on Somerset left other flooded regions largely ignored. They further reflected that the media did not report on the thousands of homes that were not flooded due to flood defences. This left some stakeholders frustrated and saw them engage in efforts to highlight the successful work that had been done previously. Moreover, the use of social media added pressure to those companies and individuals undertaking work in response to the floods such as river dredging, by adding a form of progress monitoring of by the public. The heightened role of social media in emergency events is an important phenomenon that can have benefits for reporting, predicting and responding to floods. However, stakeholder groups highlighted how organisations needed to divert major efforts into maintaining a constant social media presence, while at the same time being constrained in what they could and could not communicate. Public participants also noted the positives and pitfalls of social media in disaster contexts, recognising the role it had played in attracting attention to the problems in their area and communicating issues, whilst also being a source of rumour, myth, and conflict amongst those affected.

IMPLICATIONS: ADDRESSING EXPECTATIONS AND POLITICS IN FLOOD MANAGEMENT

Discrepancies in perceptions of the response to floods from stakeholders and publics can in part be attributed to misaligned expectations as to authorities' responsibilities in preparing for and coping with flood events. This could be addressed through improving the clarity of communications about responsibility for floods but, ultimately, expectations for responses to flood events relate to deeper conceptions of what is acceptable in terms of people's living conditions and well-being. There remains an unspoken social contract through which publics expect the government to provide a certain level of flood protection to citizens. This sees the attribution of responsibility and blame much more with authorities than with the public who are considered to have more limited agency in preparing for floods of this extent and

magnitude. A key contribution to the response process that members of the public could make was in the community-led actions that were instigated, and yet in some cases the interweaving of institutional responses with these led to further conflict between institutions and the public. Attentiveness to community level responses and the timing of different modes of information provision and response could make an important contribution to ensuring less conflict and contestation in post-flood contexts and better perceptions of institutions. The politicised nature of flood response has direct implications for longer-term management of floods and adaptation. In contexts where the frequency and severity of floods is expected to increase, the role of flood events in driving or disrupting strategic and longer-term planning requires greater consideration.

THEME THREE: Place and Situated Perceptions

HIGHLIGHTS

- Public perceptions are related to the places in which they live and the particular social, political and economic characteristics of different areas.
- The research highlights the importance of sensitivity to differences between places and attentiveness to the specificity of particular contexts in understanding responses and creating solutions for flooding.
- Future flood management initiatives could be improved by giving consideration to the importance of the value people attach to the places in which they live.
- Relationships with place can act to limit adaptation but can also be important in supporting people's recovery as they re-establish connections to their homes, communities and areas.



SUMMARY

The uniqueness of particular areas and the forms of place attachment that develop are important for understanding public responses to flood risk. This pertains as much to the social and political landscape, current and historic, as the material environment. The attachments that people have to the material environment, as well as the aesthetic and cultural dimensions of the landscape, play a significant role in how people react to flood events throughout the recovery and response process, including attitudes towards building resilience for future flood events. Attachments to place can result in a desire to maintain particular characteristics of the landscapes and retain traditional practices for flood management. This can conflict with the need to adapt to future flood risk, which is likely to involve significant changes both materially and socially. In terms of political dimensions, public views on responses to floods are linked to perceptions about differences in the ways other areas are treated by authorities and government and this has implications for public reactions following floods. Re-forging connections with home and place more widely is an important part of recovery processes after flood events with implications for well-being. This is particularly challenging, however, in post-flood contexts where homes have been re-built and the local environment continues to evoke memories of the flood event. Despite this, there is an imperative to re-build attachments to places for the long-term future of regions at risk from flooding in the absence of politically and financially viable re-location options for residents.

RESULTS AND EVIDENCE

3.1 The Influence of Place on Perceptions of Causes and Solutions

The survey results provide an opportunity to examine differences and similarities in attitudes towards the causes and solutions for flood risk according to place. The most striking difference in attitudes towards causation is that almost twice as many Somerset respondents attributed the cause of floods to land management choices as respondents from Lincolnshire. The survey results also show that fewer respondents in Somerset attributed the causes of floods to climate change than in Lincolnshire.

The percentage of respondents attributing causes of floods in the UK to climate change was higher in Boston (25%) than Somerset (13%).

This is likely, in part, to be a reflection of the type of flooding that occurred in the two regions during the winter of 2013/14; in Somerset the flooding was predominantly riverine exacerbated by seasonal high tides, whereas in Lincolnshire the flooding was caused by a coastal surge. Additionally, the survey was targeted at areas in each of the counties that were particularly badly affected by the floods. In Lincolnshire this meant a focus on the area of Boston, which is a town that was protected by hard flood defences. In contrast, the respondents from Somerset were spread across the county in multiple villages and rural areas. This may have further contributed to differences in views on the causes of the floods. Finally, the nature of the flood events in Somerset and Lincolnshire was fundamentally different, with the flooding in Somerset continuing for a period of weeks, whereas the flood water that inundated Boston, Lincolnshire receded after a few days.

The percentage of respondents attributing causes of floods in the UK to the three land and/or water management choices given were almost twice as high in Somerset (27%) as they were in Boston (13%).

Reflective of these differences in how respondents in the two areas viewed the causes were differences in the perceptions of solutions to floods. Whilst overall property level protection was viewed as important in both Somerset and Lincolnshire, the difference in the flood events of 2013/14 across Somerset and Lincolnshire is perhaps reflected in the lower numbers of Somerset survey respondents that perceived property level flood defences as a very important solution for future flood events. This is consistent with findings from the interviews which also highlighted public views on the limitations of property levels flood defences when the flood waters are deep or where the house itself is of a particular form or design (e.g. cob houses). Moreover, some of the more challenging cases to resolve in Somerset were those of groundwater flooding where the impacts were structural and not immediately apparent. In these examples, flooding would not have been prevented by property levels flood defences and available resilience measures would not have been sufficient in the face of more fundamental problems caused by prolonged exposure of buildings to water.

There was also a difference in the proportion of those who felt that large scale flood defences were very important between Somerset and Lincolnshire, with a higher number of respondents from Lincolnshire feeling that large scale flood defences were very important, although overall levels of importance were high across both regions. The differences could again be attributed to the type of flooding within the two areas - i.e. tidal versus river flooding - and the necessity of large flood defences

to protect against tidal surges. Additionally, the historical approaches to managing flood risk differ across the two areas with hard flood defences already existing in and around Boston, versus a history of land drainage, dredging and pump systems in Somerset. These differences may, in part, explain variations in the responses to the survey on questions of causes and solutions. This is indicative of the importance of being sensitive to the specificities of homes, types of flooding, and different areas, in advice about responses to floods, and in communications about flood responses. Though sharing of best practice across areas is an important ambition in improving flood risk management, this is likely to require recognition of the different circumstances and experiences across places.

3.2. Politics, Place and Responses

The research highlights the role of politics in the decision-making processes about responses relating to flooding. It further provides insight into how politics are perceived to operate in post-flood contexts and what this means for public discourse. The public and stakeholder interview cohorts discussed processes of funding allocation according to political priorities instead of through strategic prioritisation processes.

“*In fact, when the floods happened, it was flooded here for ages and it wasn't making major news and then as soon as The Thames flooded and someone's grand piano got wet on the banks of The Thames, it was "oh my God, London's flooded!" but Somerset had been flooded for months before Prince Charles donned his wellies and got down here.*

Public 12

This had a multitude of impacts, but primarily it eroded trust in the process by which funds are allocated so that they come to be perceived in some instances as unfair and partisan.

“*I guess from a political stance, how many voters are down here? A handful. How many are in Walton On Thames? A huge amount. The flood defence work is going to go to places like the Thames Valley and not the Somerset Levels.*

Public 9b

Participants discussed frustration at perceptions of differential treatment and attention being given to different areas with some places being seen to be treated as more valuable than others, either through spending decisions or media coverage of flood events. It is likely that judgements about the fairness of spending decisions across different regions both before and after flood events will influence whether an individual perceives the government to be doing all that it can for areas at risk of flooding (see *Box D: Place and Funding for Flood Risk Management*). This is an important finding since results from the survey suggest that perceiving the government to have done or be doing all that it can contributes towards increased well-being after a flood event (see *Theme 4*).

“*In terms of when it the initial flooding occurred around Christmas, around the time that Nelson Mandela died, there was huge flooding in Hull, and it never hardly made the news.*

Stakeholder 14

BOX D: Place and Funding for Flood Risk Management

The importance of place and the value of including community voices into flood management decisions is a key finding of this research. However, in a wider national context this needs to be balanced by the necessity for strategic decision making about funding for flood mitigation and adaptation. In some situations, regional differences in how funds are allocated occur, with some regions better able to access institutional decision making processes, for example as a result of high levels of social capital, networks or use of social media, and attract spending for flood risk management. Public participants reflected on feeling frustrated at the lack of support for the flooding in Somerset until areas of greater national importance, such as London, were inundated. Yet stakeholders revealed the challenges they faced when spending decisions were ultimately made in favour of Somerset at the expense of other areas in greater need or where greater levels of benefit. With increasing frequency of flood events, robust long-term national policies need to be established for allocation of emergency funding in post-flood contexts. Such policies should be attentive to issues of fairness and equity, as well as local needs and preferences for how funds are used.

3.3. Landscape, Homes and Futures

Elements of landscapes that influence a person's attachment to place, can be positive for well-being over the longer-term in post-flood contexts but at the same time can also contribute to the flood risk of the area. For example, in interviews with Somerset residents the diversity of wildlife was often cited as a positive element of the area, yet the conditions needed to sustain wildlife populations can require river levels to be artificially managed and kept higher than they might otherwise be. This applies more generally to the positive effects of bluespaces for well-being (Miller et al. 2012; White et al. 2010) contrasting with the negative meanings that come to be associated with the same landscapes when floods happen.

Furthermore, the interviews illustrated how the cultural heritage of an area is interlinked with the unique industries that have evolved to take advantage of the physical characteristics of the landscape, for example willow growing in Somerset. The bonds between people and the areas in which they choose to live can be deep and connect with aspects of one's self identity and personal history. In this context, despite the detrimental impact flooding can have to the individual, the interviews showed that there is a desire to continue living in these areas. This reflects the strength of place attachment for

some people and relates to perceptions that the flooding could have been avoided or the impacts reduced with alternative management approaches.

Over half the survey respondents had been impacted by flooding at some point in their lives (53%), and of those, two-thirds (66%) had been affected by flooding more than once.

The methods by which rivers have historically been managed in order to reduce flood risk have contributed towards both the aesthetic and cultural dimensions of the landscape. Thus, expectations for current flood risk management are also influenced not only by perceptions about the efficacy of an approach but also by desires to maintain, or change, the current landscape. The public interviews reveal the depth of the perception that the Somerset Levels and Moors is a 'managed' environment. With this attitude comes the expectation that if management activities, such as dredging and ditch clearances, had continued the flooding would not have been so severe. Whilst most participants acknowledged that dredging is only one of a suite of solutions for mitigating flood risk, it was believed to be an important option for particular areas. However, positive perceptions of solutions to reduce flood risk often conflict with the



“ One of the other things that people would often say in [Somerset] was, “Look at Holland, they're a low lying country, very susceptible ...”, similar to the Somerset Levels “and yet they don't flood, they must be doing something right, they're spending millions and millions on flood management, we're not, why don't we follow the Dutch example?”. Well actually, what people again don't appreciate and this gradually did come out in some of the media and again *The Guardian* and *BBC* were very good at this. The Dutch had a real paradigm shift in their flood management, mid 90s, they actually allowed certain agricultural areas to flood, to protect more high priority areas and they relocated farmers. So following the Dutch model, actually a lot of the farmers on the Levels would probably be allowed to flood and relocated because the Dutch realised that you cannot just go on building ever higher and higher defences, fighting against nature, eventually it will be breached and it will be catastrophic. It's actually cheaper and more effective to work with nature and allow some of these areas to flood.

Stakeholder 23

reality of the changes to the landscape that are involved in their delivery. In the interviews, ‘the Dutch approach’ was often cited by public participants as an ideal approach to reducing flood risk in areas like Somerset, yet some stakeholders reflected that the imposed and extreme nature of this approach would not be acceptable to the British public. This contrasts, however, with some residents’ reflections on their desire to leave the area but feeling unable to move given reductions in values of their properties at the time following the flood. The research suggests that more radical solutions of relocation would be controversial but also signals some appetite for possibilities such as these.

Place attachment extends into the home; homes act as a barrier to the outside world and provide a safe and stable environment, which is destabilised when flood waters enter the property (Simms et al. 2009).

The processes of recovery and options for property level resilience measures are influenced by these connections to home. People may be reticent about installing flood resilience and resistance measures because of the way it changes the fundamental nature of home as a secure place by being a visual reminder of the flood event (see also Harries 2008). The architectural type and age of a property and specific forms of flooding are also important differentiating factors in property level and wider solutions. For example, in cases where houses are listed properties the challenges of reconstruction are markedly different to those in newer homes. Household level resilience and resistance approaches for tackling and responding to flooding could be better attuned to these types of differences in homes, and sensitive to the emotional and practical challenges associated with their installation.



IMPLICATIONS: THE IMPORTANCE OF PLACE IN FLOOD RESPONSE AND RECOVERY

Places and homes vary significantly in the forms of flooding that are experienced (e.g. effluent or clean water; prolonged water in homes versus flash flooding, river or coastal) and this has implications for the types of solutions that are perceived as appropriate, particularly at the property level. The research provides some indications of a relationship between the place in which people live and attitudes about the causes and solutions to flooding. This suggests the importance of being attentive to place (across dimensions from landscape, to homes, to demographic and political features) in communications and recommendations relating to responses.

These findings also highlight the importance of re-forging connections with home and place more widely as a vital part of the recovery processes, particularly in relation to flooding as an act that can rupture connections to place and to the futures that people had imagined for themselves. This has particular relevance for those communities at increasing flood risk which do not meet the UK Treasury rules for spending or where hard flood defences are not appropriate. In combination, these findings suggest that place and the values people attach to it can be harnessed as a positive factor in the creation of long-term adaptation strategies for flood risk management, but only with attentiveness to its importance as a factor in the formation of people's perceptions and responses.

THEME FOUR: Flood Experiences, Community Resilience and Well-being

HIGHLIGHTS

- Community support and cohesion are key components of short and long-term resilience, and provide a protective factor against the detrimental well-being impacts of flooding
- Community workers provide localised support measures but also offer a link to more formal institutional mechanisms.
- Perceptions of agency – the ability to take independent action – in processes of response have important implications for well-being
- Stress and anxiety as a result of flooding are likely to not be reported yet they impact on the personal and work lives of those affected
- Well-being impacts are seen in those with professional roles such as engineers and front-line workers, and are related to working with people in extreme distress, and the emotionally charged nature of political and public debate creating highly stressful working environments.

SUMMARY

Within the stories of flooded individuals, there were many examples of how the negative impacts of flooding can be mitigated by support from the community, through the networks and relationships that exist for example through schools, the Church, or friends and neighbours. Community resilience is particularly important in cases where infrastructural resistance and resilience is not possible. The presence of village agents and other volunteers provided localised support, for example by signposting people towards more formal types of institutional support, and by boosting morale at a time of high anxiety and stress. Community help and cohesion plays a particularly important role in mitigating the mental health and well-being impacts from flooding, which are long lasting and complex, and rarely resolved when the flood waters have receded. The impacts to well-being can be low level prolonged stress and

anxiety that are less likely to be reported to medical professionals and yet can be just as debilitating in terms of being able to function in the home and at work. Unreported impacts can be easily overlooked in official reporting procedures and uncounted for when the costs of floods events are calculated. Furthermore, front line workers can also suffer mental health and well-being impacts as a result of working in high pressure and emotive situations.

RESULTS AND EVIDENCE

4.1 Social Resilience

When community was discussed with public participants, there were several key narratives that frequently arose. The first was connected to the community spirit, how the community came together and helped each other out, from tractor-trailers used as makeshift public transport, through to regular emails informing people of when to move their cars to higher ground. From checking on neighbours and making cups of tea to doing laundry for those in the community whose homes had flooded. Furthermore, the support and effort contributed by volunteers not only boosted a feeling of resilience but was also a source of emotional support. For some, however, the external volunteers coming into flooded communities needed to be managed better, particularly by being clearly identifiable as volunteers and not 'flood tourists'.

“ *There were good bits which sounds awful in times of flooding but the community coherence stuff was just phenomenal, it really brought you, it re-engaged your faith in humanity actually.* ”

Public 21

The second narrative of community resilience was described as the ability of the community to work together and achieve change. Examples included expertise within the community being used to organise funding for community-level defences or groups forming to develop flood plans both within their community and also sharing best practise with other communities. These actions tend to indicate a level of existing social networks that facilitated this but there is evidence within the data that new relationships were also formed. On a related theme, the value of the community support workers and the wider volunteer response was clear; the ability of the support workers, particularly village agents, to provide a local response and signpost residents to more formalised support structures was perceived as very important. The national volunteers response (often termed convergent or spontaneous volunteers), although difficult to manage from a stakeholder perspective, was able to boost the moral of those in the midst of flooding and reduce feelings of regional isolation.

“ *A bit of a Blitz spirit thing, which can be quite bonding to a community, to face a common threat and to be ... the experience of neighbours helping one another is a good thing. There's an awful lot of goodwill that was generated.*

Public 16b

Finally, the third narrative that emerged about community involved focus on increasing resilience such that residents could cope with events like the flooding with less reliance on the emergency services and institutions. This, in part, stems from a perception that the institutional response was slow and did not meet expectations. Many participants spoke about positive feelings associated with being able to cope with the floods themselves and a satisfaction of being able to help friends and neighbours. This speaks to the importance of agency within post-flood contexts for people's well-being and abilities to cope.

The importance of community support in mitigating detrimental well-being impacts is further revealed in the survey results. For those in some way affected by

the floods (from water in their homes to stress and anxiety caused by the flooding), elements of community cohesion were important for well-being; as perceptions of community cohesion increased, well-being increased at all time points (see figure 4). In contrast, feelings of community acceptance and well-being were only correlated at time points after the flood event. This suggests that the flood event acted to bring people together during the flood, encouraging networks and bonds to form and bolstering the sense of community. The role of community was reflected upon by stakeholders too; villages that were frequently affected by flooding were perceived as having greater levels of emotional and social resilience as a result of pre-existing flood plans and high levels of bonding and bridging capital.

“ *I don't know for sure, I know that in one village, they've been flooded loads of time and they have a flood plan and they have, we don't actually work very much there because it feels as if they sort of... it wasn't such a surprise to them and they already had a flood plan and they already were supporting each other, it's quite interesting really. Whereas in other areas, it wasn't expected and in a lot of those villages, they didn't really have a proper sense of community and people were not supporting each other, they didn't have flood plans, it was all very reactive.*

Stakeholder 10

84% of respondents agreed or strongly agreed that the community spirit made it easier to deal with the floods and 85% of respondents agreed or strongly agreed that the community provided support that was unavailable from the authorities.

69% of respondents agreed or strongly agreed that support workers from the community have been really important in helping the community recover from the floods.

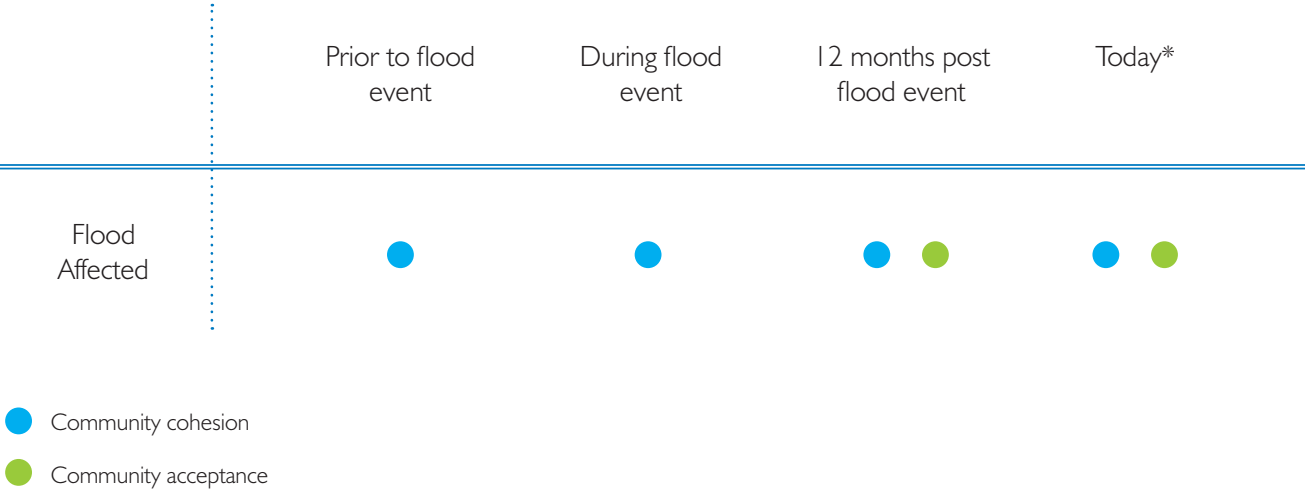
“ Local communities have shown that they can, not quite look after themselves but they can do a great deal for themselves.

Public 26

The community cohesion scale measured people’s perceptions of trust in the community and whether their community respects differences. The community acceptance scale measured peoples perceptions of whether the community pulls together and feelings of belonging to their community.

The survey data identified four key variables that, in combination, best predicted well-being 12 months post flood. Those survey respondents with high well-being during the flood, who believed that the community pulled together and perceived feelings of belonging to their community (i.e. community acceptance), who experienced a straightforward recovery process and who believed that authorities had done all that was possible to help the public tended to have higher well-being scores 12 month post flooding (see *Supplementary Materials on project website*).

Figure 4: Schematic showing the significant relationships between the measures of community acceptance and cohesion, and well-being at four time points related to the 2013/14 winter flood events. A positive correlation was found between the community cohesion scale and well-being at all four time points. The community acceptance scale showed a positive correlation with well-being at 12 months post flood and at the present day. No relationship was observed between the community acceptance scale and well-being during the floods or prior to the flood event. See Supplementary Material, table B-2 for Pearson’s correlation coefficients. Flood Affected includes being directly affected by the flood, for example having flood waters in the home, through to difficulties getting to work and being stressed or anxious because of the floods.



*In the survey, all participants were asked about their present day well-being; only those participants who had earlier indicated that either they or their community were impacted by the 2013/14 floods were asked about their well-being at the three earlier time points.

4.2 Well-being and Mental Health

The detrimental impacts on mental health and well-being are clear both from the qualitative interview and through the survey results. The impacts are present during the time of the flooding, and extend after the flood waters recede, as homes are being rebuilt and people are struggling to interact with multiple institutions whilst also trying to maintain as near to normal a life as possible. The longevity of the impacts on well-being are particularly clear at 12 months post flood, where those who had experienced flooding continue to have lower well-being scores than those who had not (see figure 5). Interview data suggested that front-line workers and volunteers also suffered detrimental impacts to mental health and well-being as a result of the flooding. Many stakeholders reflected on this, with examples given of the pressure of having to work in stressful conditions, as a result of the expectations from government and residents, and in some cases dealing with verbal abuse from flood affected individuals.

The long term nature of the mental health issues following flood events were reflected upon by stakeholders both in terms of their duration and also the fact that such problems often come to light much later in the recovery process.

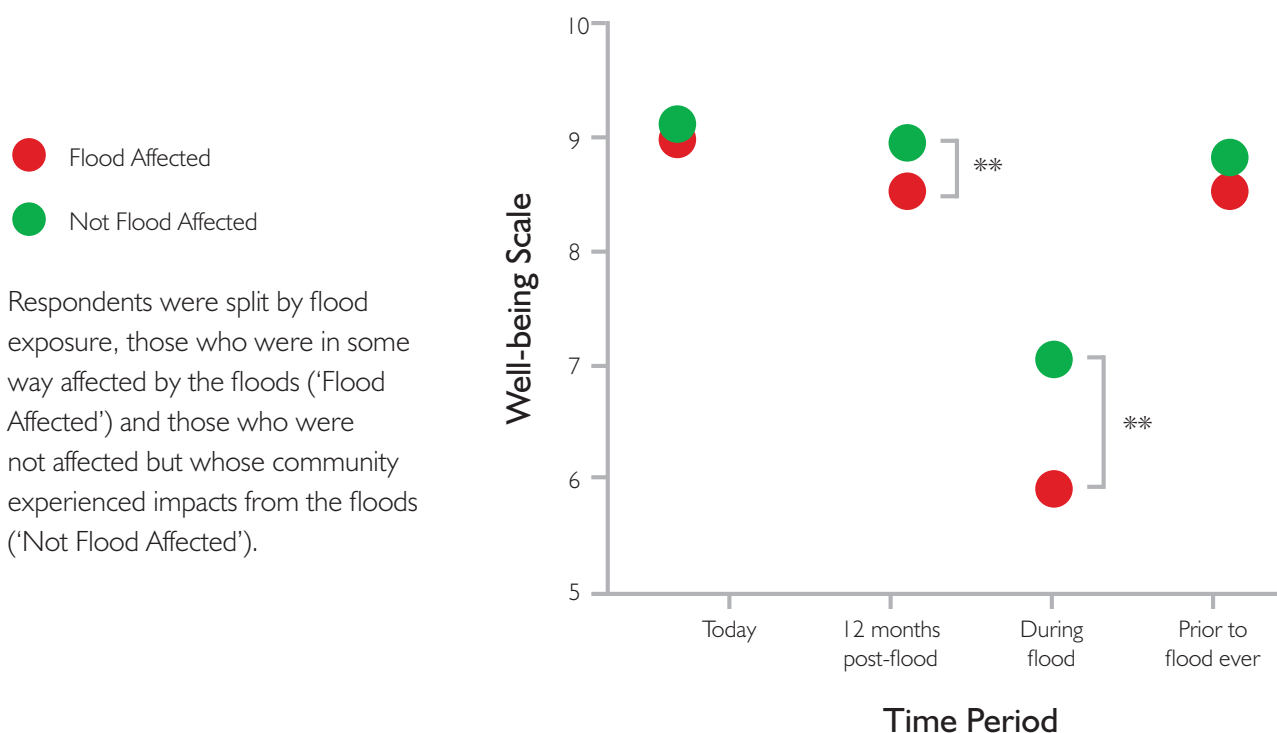
The type of mental health provision that was instigated included specialist social workers and counselling provision to facilitate access to mental health support in a variety of ways. Barriers to setting up such wide scale mental health provision included delays due to internal bureaucracy and lack of support from overstretched mental healthcare providers. Conversations with stakeholders during the second interview revealed the need for mental health awareness to be embedded throughout the emergency response and recovery process from the beginning, to better accommodate the needs of those affected by flood events.

“ That was all going on and as things were happening and I was hearing people talking in the office, I was saying to some of my colleagues, “What’s happening around the emotional health impacts of all of this?” and stating it put some pressure on my more senior colleagues to say “Can you please raise in the Gold Command, what’s happening, what information is being put out there for people to do with their emotional health?”

Stakeholder 10



Figure 5: Scatter plot showing mean well-being scores of survey respondents, split by exposure to flood impacts, at four time periods surrounding the 2013/14 flood events: before the floods; during the floods, 12 months post floods and present day. Within the whole sample, significant differences (**) were seen between well-being of those affected and not affected by the floods at two time points: during the floods and 12 months post floods.



The consequences of institutional actions during crises such as flood events can be seen clearly when the impact of evacuation is considered. Those who were evacuated have significantly lower well-being scores than those who remained in their homes, both during the flooding and 12 months post flooding. Such was the importance of community support, that there were examples of evacuated residents setting up their own keep-in-touch groups, to facilitate support from the their communities that were no longer in geographical proximity. This finding demonstrates the importance of community support in creating resilient communities, and indicates that whilst some actions undertaken by institutions are necessary, there are mechanisms by which the detrimental affects can be ameliorated (see *Box E: Public Health Responses to Flooding*).

“ First of all, you are separated from all your possessions, therefore your normal life is on hold totally. For some people, it was a very emotional experience at the time, we were involved a lot with a Keep In Touch group, help setting it up, organising it, contacting people, giving support, so in fact we were incredibly busy.

Public 20

On a scale from 0 (low) to 10 (high), those that had been evacuated rated their well being as 4.6 during the floods and 8.0 twelve months post flood, compared with those who were not evacuated who rated their well being as 6.8 during the flood and 9.0 twelve months after the floods.

BOX E: Public Health Response to Flooding

Whilst much of the emergency response and recovery efforts that occur in the wake of a flood event focus on the physical impacts of flooding, on evacuation, and ensuring that communities have access to vital services, both public and stakeholder participants acknowledge that the emotional well-being of flood affected people must not be overlooked as the recovery process continues. In the Somerset case, village agents and emotional support workers were a vital component in the public health response to the floods. Although village agents had been in post prior to the 2013/14 floods, they alongside the emotional support workers provided much needed support to residents in the villages they served. Often as members of the community themselves, village agents were able to identify individuals who needed extra support and provide advice on possible options. In particular the village agents were perceived as really useful in facilitating access to information and to grants for which local residents might be eligible. The emotional support workers were specifically tasked to help with the flood recovery programme, and were able to provide specialised support services to those who in emotional distress as a result of the flooding. This type of localised support has relevance for building social resilience across the country. Currently the scheme is predominantly found in rural areas, however urban areas, particularly those that lack networks, would benefit from a scheme of this type to overcome feelings of isolation, to relay information and advice, and to act as an intermediary between the authorities and the general public in times of crisis. Another example of services to overcome the mental health and well-being impacts of flooding was a neuro-linguistic course (The Warrior Programme) designed to help returning combat veterans and their families deal with post-traumatic stress disorder. An adapted version of the course was provided to a small number of Somerset residents, funded through the insurer Legal and General. Those who participated in the course reflected that it allowed them to visualise a positive future again despite living in a region at risk of flooding.

IMPLICATIONS: WELL-BEING IN THE AFTERMATH OF FLOODS

The findings in this section relate to the role of the community during flood events, particularly the importance of community in mitigating the mental health and well-being impacts of floods. The results reveal the underlying complexity of the impacts to well-being from floods, and shows that they are influenced by the individual, the community and institutions involved in flood risk management. Traditional interventions alone, for example those focussed on talking therapies, do not encompass the community support aspects that have been shown in this research to be an important factor in helping individuals deal with flooding.

Moreover, the role of tangible actions undertaken to reduce flood risk in mitigating residents' concern about future flood events should not be underestimated. A holistic approach to dealing with the mental health and well-being impacts of floods needs to consider all aspects collectively, crossing disciplinary and departmental boundaries. Such an approach should aim to provide a range of support options that would be most effective if co-produced with the communities at risk of future flooding. This would ensure that any interventions were necessary, appropriate and did not conflict with any support mechanisms set up by the communities themselves.

Conclusions

The research examined public and stakeholder perceptions of the causes, solutions, and responses to floods over a twelve-month period in the aftermath of major UK flooding in 2013/14. It also assessed experiences of flooding and its impacts across two areas badly affected by the floods, namely Somerset and Lincolnshire. The data reveals important differences in how members of the public and stakeholders understand flood risk and interpret the appropriateness of responses and responsibilities. This offers new insights into the reasons for contestation following flood events and provides evidence relevant to the development of capacities for future management of flood risk. In particular, the research highlights that in post-flood contexts there are opportunities for public engagement, for opening up funding streams to support flood management measures, and for embedding flood resilience and resistance when rebuilding homes and communities. Transparent and more strategic processes for decision-making are likely to be important in reducing contestation and capitalising on these opportunities. The data reveal important differences across places, people, and households in terms of their experiences of flooding that have relevance for the appropriateness of advice, support, and perceptions of responses. Finally, the analysis provides novel understanding of the factors that underpin and influence community resilience throughout flood events and signals the importance of policy mechanisms that support social resilience, in addition to infrastructural and economic resilience, for future flood management. In this concluding section, we discuss these key research findings and reflect on opportunities to enhance resilience, fairness, and trust in flood risk management, to ultimately inform efforts to mitigate the impacts of future flood events on UK citizens.

POLITICS, PUBLICS AND PROCESS

The research shows how major flood events provide moments in which significant political and practical action takes place to tackle floods, and openings emerge for debate and dialogue between publics and institutional actors. However, the potential opportunities for the development of flood management, policy, and transformation afforded by these moments can be

undermined by the nature of the interactions, with a conflictual and problematic blame culture being apparent at least on the surface. The research suggests that this is fuelled by a number of key issues in the responses to floods.

First, the low quality of political debate and public disputes between agencies and public figures creates poor conditions for decision-making and dialogue. The tendencies toward politicisation of flood events and the use of these occurrences to advance or entrench existing political interests and concerns (e.g. relating to electoral politics and differences between party positions) is highly problematic and diminishes possibilities for genuine public engagement.

Second, the data highlights how people in post-flood contexts can often feel isolated from authorities and left alone to cope and respond without clear indications of what they can expect of different organisations in terms of support. This has implications for people's sense of agency – the ability to take independent action – in processes of response, which in turn leaves people with limited recourses to achieve influence and attract attention to their plight. The scope of people's actions can be limited to localised, small scale community responses and uses of social media, and the media more widely, as a communicative vehicle. This can contribute toward conflict as the terms of the debate become narrowed by the nature of media communications.

Overall these two issues contribute to the production of conflict between institutions and affected people following floods and create difficult contexts for public meetings and local engagement. Actions to address this could come in the form of clear information about what people can expect from key agencies in post-flood contexts (i.e. local government, the Environment Agency, emergency services). This is not entirely straightforward, however, as expectations for government support and assistance during recovery from floods are embedded in deeper understandings or ideals about the role that government should play in ensuring the socio-environmental conditions needed to live healthy lives (see O'Brien et al. 2009).

As such, formulating information about what people can expect would benefit from being allied to new arrangements for spending on response and recovery after flooding events to ensure that money is being spent in ways that facilitates longer-term resistance and resilience. Ensuring clearer and more strategic processes for allocating public funding post-floods could offer local agencies a stronger basis for engaging with those affected about the kinds of responses they can expect (see *next section for further discussion of funding*).

Third, differences in the understandings that people have of flood causes and solutions can be a source of conflict but these are ultimately underpinned, across all parties, by a desire to implement approaches that improve flood management, resistance, and resilience. This over-riding concern to find solutions that work for different areas is shared and should be a source of two-way dialogue but too often a lack of tangible solutions being presented for discussion can result in a focus on singular issues or responses that may not be the most appropriate for any given area.

The importance of authorities being able to offer and take tangible action to reduce flood risk for those affected cannot be overstated. The connections that people make between historic and current actions to reduce flood risk in their assessments of the causes of flooding, indicates the importance of engaging in discussions about solutions that encompass the range of flood risk reduction options available and the possibilities for funding support. That is to say, all options, whether agencies see them as appropriate or not, should be open for discussion along with the relative benefits of different approaches balanced against costs. This relates to a need to engage with the experiences and perspectives of those affected, rather than attempting to counter or 'correct' people's views.

It is by now generally understood that in order to be effective, communication must be a two-way dialogue and not simply information dissemination. Perhaps more important than this in post-flood contexts is *meaningful* dialogue that engages with people's concerns and knowledge, while also articulating what can be done

to address floods (both in terms of flood management for catchments and for people's homes) and where funding can be accessed. More broadly, information and communications will be interpreted based on existing conceptions of agencies and people, with trust playing an important role in how they are received (Wynne, 1996). The findings relating to climate change revealed in this report show how in some cases this narrative was perceived as being used to excuse inaction. This highlights how communicating about causes without discussion of tangible solutions can generate feelings of mistrust about motives for conveying certain narratives. This is not to say that climate change should not be discussed, but that how this risk is going to be managed into the future is most important for those people living with increasing flood risk.

KEY MESSAGES

Several areas of opportunity exist in post-flood contexts for the delivery of long-term solutions to floods. Amongst those affected and working in institutions there is a desire to find solutions that work for people in the long-term and openness to more unconventional solutions by those affected (e.g. relocation). Flood events provide openings for public debate and engagement with the issues, as new networks and groups are established and more formal meetings are held. Processes of recovery and repair offer opportunities for resilient and resistant forms of rebuilding. At present, these are not necessarily being capitalised on with ongoing tendencies for 'return to normal' without transformative actions to limit impacts and build resistance to future floods.

FUTURES AND STRATEGIC DECISION-MAKING

Flood events are expected to become more frequent and severe in the future; this needs to be reflected in the arrangements for responses to floods so that efforts are directed toward improving long-term resilience and resistance, rather than straight forward repair and return to normal. The research reveals the pervasive view among both publics and stakeholders that political influences skewed fair and considered decision-making during and after the flood events of 2013/14 with implications for effective long-term policy. Flood events do open up alternative funding streams; there is public funding for emergency response as well as political opportunities for generating increases in funding allocations for flooding, and there are high levels of private insurance financing that go into recovery and repair. However, tendencies for emergency funding to be allocated at times of intense pressure and stress following floods can contribute toward short-term decision-making that lacks strategic direction. Processes for allocating funding at these times should be better formalised so that communities and local authorities can know with greater clarity what opportunities are available for additional funding allocations following major events. This is to recognise that major floods are likely to happen more frequently and enable a greater degree of strategic oversight in the decision-making and funding distributions that occur. The forms of funding that are available in post-flood contexts sit outside of normal formalised procedures for capital and maintenance spending, and as such, could support solutions for areas not likely to achieve investment through normal mechanisms. More formal processes for the allocation of funding with greater focus on long-term resilience could go some way to opening up capacities for local government and agencies to offer tangible possibilities for action following floods.

We argue that lower cost solutions to flood risk and/or new ways of allocating funding for flood risk management are important to overcome limitations in flood response for areas affected by flooding but not able to meet economic assessment criteria for

national funding, particularly given that the number of properties at high risk is expected to increase in future (Sayers et al. 2015). Some existing mechanisms are beginning to support this type of response, such as the Flood Mitigation Fund, which promotes the installation of resilience and resistance measures amongst householders during repair and recovery phases. However, in many cases across the UK during the 2013/14 flood event (and subsequently in the 2015/16 floods), property level protection would not have been sufficient, be that because the flood waters were contaminated, the water depth was too high, or the style of housing meant that such measures would have been ineffective.

With rising insurance premiums and excesses, particularly in the case of non-residential premises which are not covered by Flood Re, property owners in flood risk areas are facing an increasingly uncertain future, both financially and emotionally. Even for domestic properties that are eligible for the Flood Re scheme, re-building homes is a stressful experience full of disruption both physically and to the mental constructs of home itself. In this context, relying on insurance to remediate flood damages in areas that do not meet economic criteria for national flood defence funding is insufficient in economic, social and moral terms.

The options to locally raise funds to support projects that do not qualify for national funding should be examined within regions to decide if such an option is appropriate. However, clarity about the aims and scope of locally raised revenue needs to be maintained to guard against accusations of mismanagement and to maintain public support for such arrangements. The research highlights how people affected by flooding sought a clear single source of information and clarity over what they could expect to happen with regards to responses. A local body could potentially offer such a service but this would need to be built into its functional purpose. The formation of a new regional body within the case study area of Somerset following the 2013/14 floods could offer valuable lessons for the possibilities of other local bodies and what their functions might be in the future.

Trends toward localism more broadly could support the creation of such bodies with community engagement and flood management oversight functions but, as has been observed elsewhere (Thaler and Priest, 2014), there is a need to ensure that moves toward more local forms of flood governance are matched with transfer of resources and social capacity.

KEY MESSAGES

The research gives insight into problems associated with the contexts for decision-making following major flood events. Flood emergencies create openings for the allocation of public and private funding for recovery and repair, and generate political opportunities for new funding streams to support future flood management. At present, processes of decision-making and funding allocation are not strategic and tend to be responsive to and embroiled in poor quality political debate and public rowing. Several steps could be taken to improve decision-making environments for spending and response in post-flood contexts so that they are more strategic and likely to be effective in the long-term. 1) Improve the quality of political debate and ensure flood events are not used as opportunities for political point scoring. 2) Enhance public engagement by ensuring communications are based on clear articulations of what people can expect from different agencies, and tangible practical actions that can be taken by both authorities, householders, and businesses to mitigate flood risk in future. 3) Ensure more strategic processes of funding allocation in post-flood contexts to facilitate the ability of agencies to deliver tangible solutions, particularly for areas where cost-benefit analysis means they would not be able to access investment through normal, national mechanisms.

SOCIAL RESILIENCE AND WELL-BEING

Flood events represent highly stressful and disruptive times for those affected and an important part of the recovery process concerns mental health and well-being (Tapsell et al., 2002, Tapsell and Tunstall, 2001, Tunstall et al., 2006, Fordham and Ketteridge, 1995, Whittle et al., 2010). The research shows that social cohesion and community acceptance are key factors influencing peoples' ability to recover from the negative impacts of flooding on well-being. This finding is consistently corroborated in international research on community responses to other disaster situations (Wickes et al. 2015; Norris et al. 2008). We recommend a greater focus on promoting and facilitating social cohesion, although it is recognised that this is not without challenges. Our data on experiences of flooding illuminates the vital role of community workers, such as village agents, in providing localised support, facilitating information dissemination, and offering a point of connection between governance institutions and local communities. Such intermediary positions have a remit across all emergency situations and there is a clear opportunity to expand and evaluate their potential benefits as a means of improving resilience across society. The research further highlights the value of encouraging local communities to write flood plans or other such emergency procedures as a way to stimulate conversations around future planning and generate connections between community members. However, the data also reflect the possibility that in the event that flooding happens irregularly, the impetus to practice or to be prepared may wane over time. On balance, the promotion of activities that facilitate communities working together and getting to know each other will help create cohesive communities that can draw upon collective strengths in times of need.

The research reveals that it is during the response and recovery phases of flood events that the actions of governing institutions can both positively and negatively affect community resilience. We suggest that efforts should be made to work with communities in deciding how to deal with post-flood situations in ways that best fit their immediate and longer-term needs. In our research, people that felt a greater sense of agency

reported enhanced feelings of well-being. As such, response and recovery support could benefit by being led from the ground-up to enhance feelings of agency, avoid conflicting with community led responses, and to establish trust. Community agency and collective actions in response to flood events can act to reduce some of the pressures on emergency services (see also Twigger-Ross et al. 2011). However, this is not to say that immediate and longer-term support is not needed from authorities. Indeed, the findings show that the perception the authorities were doing all that they could was a key factor that explained higher levels of well-being post floods.

Often, in the throes of an emergency response, mental health and well-being are not primary considerations with risk to life and physical health taking priority. While institutions involved in flood risk management increasingly recognise the importance of well-being and establish protocols to enhance and promote emotional well-being in emergency situations, assessing and measuring mental health impacts is not straight forward and, our research indicates, may be significantly underestimated. The research shows that many effects are more subtle, frequently not reported, and not characterised by post-traumatic stress disorder, so are not likely to be accounted for within current assessments of flood impacts. The effects over time are also difficult to determine given the many other factors within people's lives that affect emotional stress and mental health. Key aspects of the response to mental health issues in post-flood contexts can be non-medical, such as supporting reconnections with homes, places and futures in the face of uncertainty about flood risk and, for many, an inability to relocate for financial reasons (Tapsell and Tunstall, 2008, Carroll et al., 2009, Harries, 2008). Enhancing resilience to flooding is a central objective of UK flood policy given that the frequency, severity and economic impacts of flooding are increasing. We argue that material and infrastructural resilience have been given more weight than social dimensions, such as community cohesion, networks, and social support.

We propose that projects that actively seek to enhance social resilience using a place-specific, community-centric approach, be used across at-risk regions of the UK. The importance of social resilience has been highlighted in initiatives such as the DEFRA Flood Resilience Community Pathfinder Scheme, which aimed to encourage novel approaches to improve communities' resilience to flooding (Twigger-Ross et al. 2015; Begg et al., 2015). Given this increasing body of evidence to regarding the importance of community resilience, these dimensions of resilience should be given greater weight in policy and practice.

KEY MESSAGES

The pivotal role of social cohesion and community in recovery from flood events highlights the importance of expanding and deepening support for social resilience in flood management policy and practice. A wide range of actions can support social resilience and examples revealed in this research include: 1) Wider use of social support workers (like village agents in rural areas) that provide localised support and facilitate information exchange and dialogue between institutions and communities. 2) The development of human agency through coordination of flood plans and resilience measures (where appropriate) and genuine dialogue that reflects an awareness from institutions about how their actions can positively and negatively impact community led resilience initiatives. 3) Institutions working towards ensuring that social infrastructures are in place which can effectively harness the contributions of convergent volunteers, agencies, and communities.

References

- ADGER, W. N. 2008. Government, responsibilities, barriers and actors in adaptation action for climate change. *In*: BIERBAUM, R., BROWN, D. & MCALPINE, J. (eds.) *Coping with Climate Change*. Ann Arbor: University of Michigan.
- ADGER, W. N. 2016. Place, well-being and fairness shape priorities for adaptation to climate change. *Global Environmental Change*, 38, A1-A3.
- ADGER, W. N., QUINN, T., LORENZONI, I., MURPHY, C. & SWEENEY, J. 2013. Changing social contracts in climate-change adaptation. *Nature Climate Change*, 3, 330-333.
- BEGG, C., WALKER, G. & KUHLICKE, C. 2015. Localism and flood risk management in England: the creation of new inequalities? *Environment and Planning C-Government and Policy*, 33, 685-702.
- BUTLER, C. & PIDGEON, N. 2011. From 'flood defence' to 'flood risk management': exploring governance, responsibility, and blame. *Environment and Planning C-Government and Policy*, 29, 533-547.
- CARROLL, B., MORBEY, H., BALOGH, R. & ARAOZ, G. 2009. Flooded homes, broken bonds, the meaning of home, psychological processes and their impact on psychological health in a disaster. *Health & Place*, 15, 540-547.
- CHATTERTON, J., CLARKE, C., DALY, E., DAWKS, S., ELDING, C., FENN, T., HICK, E., MILLER, J., MORRIS, J., OGUNYOYE, F. & R, S. 2016. The cost and impacts of the winter 2013 to 2014 floods
- Report SC140025/R1. Bristol: Environment Agency.
- ENVIRONMENT AGENCY 2014. Section 19 - Investigation Report - Overview to coastal surge flood event during 5th, 6th, 7th December 2013. Appendix B.
- ENVIRONMENT AGENCY 2014. Flood and coastal erosion risk management Long-term investment scenarios (LTIS) 2014. Environment Agency: Bristol
- FORDHAM, M. & KETTERIDGE, A. M. 1995. Flood Disasters - Dividing the Community. *Emergency Planning*. Lancaster, UK.
- HARRIES, T. 2008. Feeling secure or being secure? Why it can seem better not to protect yourself against a natural hazard. *Health Risk & Society*, 10, 479-490.
- KLINSKY, S., DOWLATABADI, H. & MCDANIELS, T. 2012. Comparing public rationales for justice trade-offs in mitigation and adaptation climate policy dilemmas. *Global Environmental Change-Human and Policy Dimensions*, 22, 862-876.
- LEACH, M., SCONES, I. & LYNNE, B. 2005. *Science and Citizens: Globalisation and the challenge of engagement*, London, Zed Press.
- LEACH, M., SCONES, I. & STIRLING, A. 2010. *Dynamic Sustainabilities: Technology, Environment and Social Justice*, Earthscan.
- MILLER, D., MORRIS, S. & MORRICE, J. 2012. BlueHealth: Water, Health and Well-Being. Aberdeen, Scotland: The James Hutton Institute.
- NORRIS F, STEVENS S, PFEFFERBAUM B, WYCHE K, PFEFFERBAUM R. 2008. Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology* 41:127-50
- O'BRIEN, K. HAYWARD, B. BERKES, F. (2009) Rethinking social contracts: building resilience in a changing climate, *Ecology and Society*, 14(2): 12
- SAYERS, P.B; HORRITT, M; PENNING-ROWSELL, E; MCKENZIE, A. (2015) *Climate Change Risk Assessment 2017: Projections of future flood risk in the UK*. Research undertaken by Sayers and Partners on behalf of the Committee on Climate Change. Committee on Climate Change: London.
- SIMS, R., MEDD, W., , MORT, M., & TWIGGER-ROSS, C. 2009. When a 'home' becomes a 'house': care and caring in the flood recovery process, *Space and Culture*, 12: 303 - 316

- TAPSELL, S. M., PENNING-ROWSELL, E. C., TUNSTALL, S. M. & WILSON, T. L. 2002. Vulnerability to flooding: health and social dimensions. *Philosophical Transactions of the Royal Society of London Series a-Mathematical Physical and Engineering Sciences*, 360, 1511-1525.
- TAPSELL, S. M. & TUNSTALL, S. M. 2001. The Health and Social Affects of the June 2000 Flooding in the North-East Region: Report to the Environment Agency. Middlesex University: Flood Hazards Research Centre.
- TAPSELL, S. M. & TUNSTALL, S. M. 2008. "I wish I'd never heard of Banbury": The relationship between 'place' and the health impacts from flooding. *Health & Place*, 14, 133-154.
- THALER, T. AND PRIEST, S. 2014. Partnership funding in flood risk management: new localism debate and policy in England, *Area*, 46(4): 418-425
- TUNSTALL, S., TAPSELL, S., GREEN, C., FLOYD, P. & GEORGE, C. 2006. The health effects of flooding: social research results from England and Wales. *Journal of Water and Health*, 4, 365-380.
- TWIGGER-ROSS, C., COATES, T., DEEMING, H., ORR, P., RAMSDEN, M. & STAFFORD, J. 2011. Community Resilience Research: Final Report on Theoretical Research and Analysis of Case Studies Report to the Cabinet Office and Defence Science and Technology Laboratory. London: Collingwood Environmental Planning Ltd.
- TWIGGER-ROSS, C., ORR, P., BROOKS, K., SADAUSKIS, R., DEEMING, H., FIELDING, J., HARRIES, T., JOHNSTON, R., KASHEFI, E., MCCARTHY, S., REES, Y. AND TAPSELL, S. (2015) Flood Resilience Community Pathfinder Scheme Evaluation. *Department for Environment, Food and Rural Affairs*. London, UK.
- WHITE, M., SMITH, A., HUMPHRYES, K., PAHL, S., SNELLING, D. & DEPLEDGE, M. 2010. Blue space The importance of water for preference, affect, and restorativeness ratings of natural and built scenes. *Journal of Environmental Psychology*, 30, 482-493.
- WHITTLE, R., MEDD, W., DEEMING, H., KASHEFI, E., MORT, M., TWIGGER-ROSS, C., WALKER, G. & WATSON, N. 2010. After the Rain: learning the lessons of flood recovery in Hull. *Final project report for 'Flood, Vulnerability and Urban Resilience: a real time study of local recovery following the floods of June 2009 in Hull'*. Lancaster, UK.: Lancaster University.
- WYNNE, B. 1996. May the Sheep Safely Graze? A reflexive view of the lay-expert divide, in S. Lash, B. Szerszynski and B. Wynne, *Risk, Environment and Modernity: Towards a New Ecology*. (SAGE: London).



www.exeter.ac.uk/winterfloods



Find us on Facebook and Twitter:
www.facebook.com/exeteruni
www.twitter.com/UniofExeter

Information is correct at time of going to print.