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Flood Resilience Community Pathfinder Evaluation

Final Evaluation Report

October 2015

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Swindon	Giving a voice – how to empower a community	Box 8.2 / p.79
Northamptonshire	Online toolkit	Box 9.1 / p.94
Devon	Building community capital in Braunton	Box 9.2 / p.96
Chesham	Influencing perceptions of flood risk using the FloodSmart flood risk visualisation tool	Box 59.3 / p.96
Blackburn with Darwen	Business engagement – Know your risk, be prepared, have a plan	Box 10.1 / p.108
Calderdale	Financial and Household Resilience with Credit Union Loan Finance	Box 10.2 / p.112
Southampton	Establishing a flood action group (with no or limited community led catalyst)	Box 11.7 / p.128
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Cornwall	Community Flood Prevention – The Leaf Litter Project	Box 12.3 / p.157

How to Find Out More About the Pathfinder Projects

Pathfinder project	Project Evaluation Reports	Website / Resource
All	• Not yet available online	• The National Flood Forum will host the Flood Resilience Community Pathfinder resource hub
Blackburn with Darwen	• Not yet available online	• Flood Watch website https://floodwatchbwd.wordpress.com/flood-risk-areas/
Calderdale	• Not yet available online	• Eye on Calderdale website • www.eyeoncalderdale.com
Chesham	• Final Report http://www.buckscc.gov.uk/environment/flooding/community-action/floodsmart-in-chesham/	• Flood Smart website http://www.buckinghamshirepartnership.co.uk/floodsmart/ • Flood Smart: A history of flooding in Chesham video https://www.youtube.com/watch?feature=player_embedded&v=wg46U3uvQBc • Flood Smart legacy leaflet
Cornwall	• Final Report https://www.cornwall.gov.uk/media/12361015/Flood-Pathfinder-Final-Report-web.pdf • Summary Report https://www.cornwall.gov.uk/media/12361019/Flood-Pathfinder-Summary-Report-web.pdf	• Cornwall Community Flood Forum website https://www.cornwall.gov.uk/community-and-living/cornwall-fire-and-rescue-service-homepage/keeping-safe/emergency-management/cornwall-community-flood-forum/ • Cornwall Community Resilience Network website https://www.cornwall.gov.uk/community-and-living/cornwall-fire-and-rescue-service-homepage/keeping-safe/emergency-management/cornwall-community-resilience-network/ • Healthy and Resilient Communities video https://www.youtube.com/watch?v=aqycnebVoTs
Devon	• Final report • https://new.devon.gov.uk/floodriskmanagement/flood-resilience/	• Devon County Council's Flood Risk Management website https://new.devon.gov.uk/floodriskmanagement/flood-resilience/
Liverpool	• Not yet available online	• Let's Get Ready Liverpool campaign videos http://liverpool.gov.uk/crime-prevention-and-emergencies/emergency-planning/ • Let's Get Ready leaflet http://liverpool.gov.uk/media/54494/letsgetready2.pdf
Northamptonshire	• Not yet available online	• Northamptonshire County Council's Flood Toolkit website http://www.floodtoolkit.com/

Pathfinder project	Project Evaluation Reports	Website / Resource
		• Don't be a Numpty. Keep out of flood water video https://www.youtube.com/watch?v=_CIqf8elpeo
Rochdale	• Not yet available online	• None available
Slough	• Not yet available online	• None available
Southampton	• Not yet available online	• None available
Swindon	• Not yet available online	• Flood Information and Guidance video • https://www.youtube.com/watch?v=3zsuRpOixz4&feature=youtu.be • FloodBehind the Scenes gives a good overview of the project http://www.nationalfloodforum.org.uk/swindonn/ • Information and Guidance e-learning resources http://vle.newcollege.ac.uk/pub/flood/
Warwickshire	• Final report • http://apps.warwickshire.gov.uk/api/documents/WCCC-1039-10	• Warwickshire County Council's Flooding website http://www.warwickshire.gov.uk/pathfinder
West Sussex	• Not yet available online	• None available

Executive Summary

The Flood Resilience Community Pathfinder scheme was intended to enable and stimulate communities at significant or greater risk[1] of flooding to work with key partners to develop innovative local solutions that:

- Enhance flood risk management and awareness in ways which quantifiably improve the community's overall resilience to flooding.
- Demonstrably improve the community's financial resilience in relation to flooding.
- Deliver sustained improvements which have the potential to be applied in other areas.

Defra launched the scheme in December 2012, with the announcement that up to £5 million was being made available to fund up to 20 innovative projects between 2013 and 2015. It was open to all local authorities in England. There were 45 applications with projects[2] submitted by 13 local authorities from across England receiving funding.

Evaluating the scheme

The scheme was evaluated by Collingwood Environmental Planning (CEP) and a consortium of expert project partners. Evaluating policy interventions such as the Flood Resilience Community Pathfinder scheme generates valuable information and helps understand which actions work and are effective.

The purpose of the evaluation was to report on the progress made by the individual pathfinder projects, on the results and impacts of the scheme as a whole and to provide evidence to ensure that lessons can be learnt from the pathfinder scheme.

A mixed methods approach using qualitative and quantitative social research techniques was used to collect, synthesise and analyse evidence for the evaluation at the baseline, interim (Year 1) and end of project (Year 2) stages. The evaluation drew on and incorporated a number of data sources (collected at the community and household levels) to provide information about the impacts and outcomes generated by the pathfinder projects as well as on implementation and process. The pathfinder project teams were asked to collect some of the data for the evaluation themselves, including: information for the baseline community indicators and changes at the end of the project; and household level information collected via household surveys at baseline and the end of the project.

Triangulation of survey data with qualitative data sources has helped to address the problem of the variability of some of the data collected locally. Discussions of what the

[1] Based on flood risk categories used in the National Flood Risk Assessment, significant risk equates to a one in 75 chance of flooding from rivers or the sea in any given year.

[2] The 13 pathfinder projects are referred to throughout this report collectively as 'pathfinder projects' or 'pathfinders' and individually with the prefix of the local authority leading the pathfinder project, e.g. 'Blackburn with Darwen pathfinder' or just 'Blackburn with Darwen'.

pathfinders did and their outcomes in the five different areas of community resilience are based on robust qualitative evidence and analysis which gives confidence in the evaluation.

Using a community resilience framework

A *Rapid Evidence Assessment* (REA) (Twigger-Ross *et al*., 2014) was completed as part of the evaluation and highlighted the need to understand resilience as a complex and multi-faceted concept. The concept of 'community resilience' can be broadly summarised as:

> *Communities working with local resources (information, social capital, economic development, and community competence) alongside local expertise (e.g. local emergency planners, voluntary sector, local responders) to help themselves and others to prepare and respond to, and to recover from emergencies, in ways that sustain an acceptable level of community functioning.* (adapted from Twigger-Ross *et al.*, 2011: 11)

Academic definitions suggest a key component to successfully building resilience is to understand and develop the capacities within a community. The evaluation built on Cutter *et al.*'s (2010) model for categorising community resilience capacities/resources and discussed the pathfinder project interventions in terms of the five resilience categories: social, institutional, infrastructure, economic and community capital.

Setting the scene

The policy context in which the pathfinder projects took place was one of a shift towards localism with an emphasis on communities taking ownership of flood risk through a number of governance mechanisms implemented since *The Pitt Review* in 2007 (Pitt, 2008). The Flood and Water Management Act 2010 led to the creation of Lead Local Flood Authorities (LLFA). LLFAs are tasked with developing strategy for flood risk management in their areas, maintaining a register of flood risk assets, and managing the risk of flooding from surface water, groundwater and ordinary watercourses.

This devolution of responsibility to the local level for strategy and management of flood risk is occurring at the same time as major cuts to public sector budgets are placing significant pressures on local authority finances and pushing local authorities to make difficult choices; 'new burdens' funding for LLFAs has been provided, but is not ring-fenced. The Environment Agency's long-term investment scenarios study (Environment Agency, 2014), an economic assessment of the options for flood and coastal erosion risk management in the period 2015 to 2065, states that it will never be cost-effective for Government investment to protect everyone.

Linked to this shift in responsibility for flood risk has been an ongoing process to re-structure flood insurance. Throughout the duration of the two-year scheme, negotiations

have been underway between the Government and insurers to put in place arrangements to ensure that insurance for residents in places at risk of flooding remains available and affordable (Flood Re).

The 2013/2014 winter floods affected most pathfinder projects. Although only a few pathfinder areas experienced flooding incidents in 2014/2015 it increased workloads for local authority staff and partnership organisations responsible for flooding and resulted in decreased capacity to work on pathfinder project delivery. The UK Government's subsequent announcement of the 'Repair and Renew' Grant placed an additional time pressure on some project staff, but also provided opportunities to promote messages and to join-up work.

Brief summary of the projects

As intended by Defra and shown in Table A1, the 13 pathfinder projects represented diverse characteristics. Eight of the projects involved the National Flood Forum (NFF) as the lead on community engagement. The measures developed included property-level protection, flood resilience groups, flood volunteers and community champions, engagement with more vulnerable groups and efforts to increase financial resilience.

Table A1. Overview of the pathfinder projects

Pathfinder project	Local authority lead	Area of influence	Grant allocation	Type(s) of flood risk	No. of specified communities / properties targeted	Community engagement lead(s)
Blackburn with Darwen	Blackburn with Darwen council	Blackburn and Darwen	£246,047	surface water, fluvial	2 communities	Local authority
Calderdale	Calderdale Metropolitan Council	Calderdale Rochdale Canal and Upper Calder Valley	£310,000	surface water, fluvial	150 households (directly)	Local authority
Chesham	Buckingham shire County Council	Chesham town	£300,000	surface water, fluvial	300 properties	Local authority / NFF
Cornwall	Cornwall County Council	Cornwall county	£238,000	surface water, fluvial, coastal, sewer	8000 + properties	Local authority
Devon	Devon County Council	Devon county	£488,400	surface water, fluvial, coastal, sewer	24 communities	Local authority

Pathfinder project	Local authority lead	Area of influence	Grant allocation	Type(s) of flood risk	No. of specified communities / properties targeted	Community engagement lead(s)
Liverpool	Liverpool City Council	Woodlands estate in Belle Vale ward	£306,600	surface water	30 properties	Local authority / NFF
Northamptonshire	Northampton shire County Council	Northampton -shire county	£299,150	surface water, fluvial	15 communities	Local authority / Independent
Rochdale	Rochdale Borough Council	East Central Rochdale and Heywood	£248,000	fluvial, surface water	2 communities	Local authority / NFF
Slough	Slough City Council	Slough town	£284,665	surface water, fluvial, sewer	417 properties	NFF
Southampton	Southampton City Council	St Denys ward	£472,000	surface water, coastal	39 properties	NFF
Swindon	Swindon Borough Council	Swindon East Locality borough / wards	£278,310	surface water, fluvial, reservoir	20,000 properties	Local authority / NFF
Warwickshire	Warwickshire County Council	Warwickshire county	£251,300	fluvial, surface water	10 communities	Local authority / NFF
West Sussex	West Sussex County Council	West Sussex county	£298,500	surface water, coastal	780 households / 68 parishes/ districts	Local authority / NFF

Summary of pathfinder projects' achievements in building communities' capacity for flood risk resilience

Resilience category	Key achievements
Social resilience	• Vulnerable individuals and groups identified in community flood plans • Flood information is now available in different languages and media
Community capital	• Increased community awareness, cohesion, empowerment, participation • Improved knowledge of roles, responsibilities and flood risk • Community engagement approaches that could be applied to other areas • Resources produced: toolkits, guidance, lesson plans, presentations, videos, leaflets, websites, social media existence, etc.
Economic resilience	• Insurance cover for trained flood wardens • Flood plans in place for 761 small businesses
Institutional resilience	• Establishment and maintenance of 111 flood groups, as well as flood forums

Resilience category	Key achievements
	and networks • Flood warden training and course materials • Training of local authority officers • Improved multi-agency partnership working and sharing of learning within and between local authorities • 91 community flood plans in place • Expansion of the National Flood Forum (NFF) – to continue as a trusted intermediary and resource hub
Infrastructure resilience	• 163 residential and 23 business property-level protection (PLP) installations • Innovative drainage improvement and maintenance measures, e.g. volunteers' involvement in leaf litter clearance, trash screens, rain gauge development • 39 flood stores established

Summary of key messages in building communities' capacity for flood risk resilience

Resilience category	Key messages
Social resilience	• Embedding flooding initiatives into wider, social issues can help increase relevance • Identify those areas where there is both social vulnerability and flood risk and support them in developing community resilience
Community capital	• Factor in time to develop community skills and capacities • Promote the use of locally-relevant and entertaining media and think of what will appeal to different audiences
Economic resilience	• The pathfinders have developed approaches and tools for promoting practical flood resilience measures to local businesses • Intermediary organisations can be more successful in finding ways of working with local businesses • Accessing funding is essential to enable flood groups to take proactive measures to promote local flood resilience
Institutional resilience	• Communities are better able to contribute to ensuring their own resilience if they are working with local authorities • Successful flood groups have developed where time has been taken to understand the needs of the community • Setting up flood groups and creating networks has proved to be a very valuable way of linking members of the community with formal institutions • Flood volunteers can be engaged in many different ways
Infrastructure resilience	• Having the right infrastructure makes communities better able to manage and cope with flooding and is key to building community capacity • It is important to work out what is needed with all involved in order to install infrastructure that a community can manage • Much individual infrastructure e.g. property-level protection, works better as part of a community resilience process

Community engagement

A key aspect of the pathfinders was the role of community engagement. It was the central process by which the interventions were delivered. The key messages are:

- Use a combined community-led and institution-led approach. Interventions led by community priorities may result in more effective flood resilience in the long term.
- Find out the community's starting point before beginning a project: evaluate the capacities (strengths and weaknesses) and resources within a community to find out where a community is on the resilience continuum and the extent to which community members are able to act and build resilience.
- Start with activities which develop community participation and networks but have a longer-term vision. It is essential to learn from local knowledge; listen to the needs, concerns and priorities of a community; and build on local interests to develop engagement and ownership. This may not always require a specific focus on flood risk.
- With all community engagement activities it is important to recognise that awareness raising is not an endpoint in itself and to ask the question: 'What impact will this have on the wider community, preparedness and ability to manage flood risk?'

Valuing the benefit

- The pathfinder projects identified a range of benefits of their projects and ten estimated significant monetary benefits. In robust assessments, Calderdale and Southampton calculated the monetary benefit from PLP measures (only one of a number of work packages in both projects) at well over the total project cost. Other important benefits identified by a number of projects include: increasing the community capacity to manage flood risk, improving flood warnings, reducing flooding as a result of blocked culverts and waterways and reducing the cost to LLFAs and emergency responders.

Key challenges for the evaluation

- Maintaining an appropriate balance between the observation / data collection role and the support / facilitation / learning role. A team of evaluation coordinators supported the design and implementation of the project-level evaluation plans and a separate pool of experts reviewed and assessed the evaluation
- There are significant gaps in data on community aspects related of flooding. Other indicators and data sources need to be identified for future evaluations.
- Monitoring and evaluation experience and skills, and the personnel undertaking related activities, varied widely across the 13 pathfinder project teams. The potential impact of this includes, for example, differences in data due to varied data collection modes (known as the mode effect) and differences in sample sizes.

1. Introduction

The Department for Environment, Food and Rural Affairs (Defra) commissioned Collingwood Environmental Planning (CEP), in partnership with the Flood Hazard Research Centre, Middlesex University, University of Surrey, University of Northumbria, Kings College London and nef consulting, to undertake an evaluation of the Flood Resilience Community Pathfinder (herein to be referred to as 'pathfinder') scheme.

This Final Evaluation Report draws on and incorporates a number of data sources (collected at the community and household levels) to provide information about the impacts and outcomes generated by the pathfinder projects, as well as on implementation and process. It draws out key lessons and good practice from individual projects that provide insights for potential replication by other local authorities.

Aims and objectives of the scheme

The pathfinder scheme was designed to enable and stimulate communities at significant or greater risk[3] of flooding to work with key partners to develop innovative local solutions that:

- Enhance flood risk management and awareness in ways which quantifiably improve the community's overall resilience to flooding.
- Demonstrably improve the community's financial resilience in relation to flooding.
- Deliver sustained improvements which have the potential to be applied in other areas.[4]

Through the scheme, 13 projects[5] across England were funded for a period of two years (April 2013 – March 2015). See section 2 for details of the selection process and brief sketches of each pathfinder project and community.

Aim and objectives of the evaluation

The overall aim of the scheme-level evaluation was to provide evidence to ensure that lessons can be learnt from the pathfinder scheme.

The key research objectives for the scheme-level evaluation are:

- To explore the success (or otherwise) of the intervention(s) in persuading people to change their behaviour in relation to managing flood risk.

[3] Based on flood risk categories used in the National Flood Risk Assessment, significant risk equates to a one in 75 chance of flooding from rivers or the sea in any given year.
[4] Project Specification
[5] The 13 pathfinder projects are referred to throughout this report collectively as 'pathfinder projects' or 'pathfinders' and individually with the prefix of the local authority leading the pathfinder project, e.g. 'Blackburn with Darwen pathfinder' or just 'Blackburn with Darwen'.)

- To establish what variables or characteristics of a pathfinder project and its audience contributes to the success or otherwise.
- To fully investigate pathfinder stakeholders' experiences, understanding, and response to the interventions.
- To explore particular interventions that add value by encouraging behaviours (social, economic, etc.) which could enhance the value of the interventions of the pathfinder projects at a community, individual or project-level, and improve the durability of the approach; and note any intended consequences that have occurred.
- To explore how different elements of the interventions may link together.
- To investigate the economic benefits and transferability of any financial resilience measures.
- To investigate the extent to which there is robust evidence to support future decisions for scale up and replication.
- To encourage and promote sharing of good practice between individual pathfinder projects.

See sections 3 and 4 for details of the conceptual and methodological frameworks employed by the evaluation.

Report outline

This report is structured in the following sections:

- **Section 2: An introduction to the pathfinder projects**

  Provides a brief overview of the 13 projects participating in the pathfinder scheme and how they were selected.

- **Section 3: Conceptual frameworks – community resilience**

  Describes the conceptual frameworks used by the evaluation.

- **Section 4: Evaluation framework**

  Outlines the approach used by the evaluation, including data sources, data collection and analysis methods, limitations of the data, and ethical considerations.

- **Section 5: Pathfinders aims and objectives: What did pathfinders aim to do?**

  Provides an overview of the aims and objectives of the pathfinders

- **Section 6: Inputs, activities and links to resilience: What did pathfinders do?**

  Provides an overview across all the pathfinders of their resilience building activities and how they relate to their expected activities and inputs.

- **Section 7: Community engagement**

  Highlights the different approaches and valuable lessons from pathfinder projects' community engagement activities.

- **Section 8: Building communities' capacity for resilience to flood risk: Social resilience**

- **Section 9: Building communities' capacity for resilience to flood risk: Community capital**

- **Section 10: Building communities' capacity for resilience to flood risk: Economic resilience**

- **Section 11: Building communities' capacity for resilience to flood risk: Institutional resilience**

- **Section 12: Building communities' capacity for resilience to flood risk: Infrastructure resilience**

  Sections 8 to 12 analyse the extent to which pathfinder projects have succeeded in building each of the five community resilience capacities. They draw on examples from the pathfinder projects to examine the structures, approaches and activities that have been employed, and the resultant outputs, outcomes and impacts by resilience capacity. They identify any observable changes since the baseline, successes and what has not worked, including some analysis of reasons why, how any difficulties have been addressed, and lessons learned.

- **Section 13: Calculating the benefits of the pathfinder projects**

  Examines the benefits of pathfinder projects in relation to specific activities and assesses the extent to which those benefits could be monetised.

- **Section 14: What would have happened without the Flood Resilience Community pathfinder scheme and what legacies will it leave?**

  Looks at what added value has been achieved by the pathfinder projects that would not have happened without the scheme, that is, the 'counterfactual'. It also focuses on the structures and systems that the projects have put in place to enable communities to be resilient to flooding in the long term and interventions to be self-sustaining with potential to be applied in other areas.

- **Section 15: Discussion and conclusions**

  Draws out general lessons useful for developing future community resilience initiatives, and refining current activities; as well as for addressing the particular needs of at-flood-risk and socially vulnerable communities.

2. An Introduction to the Pathfinder Projects

This section provides an overview of the 13 projects involved in the Flood Resilience Community Pathfinder scheme and how they were selected.

Funding application and selection process

The scheme was launched in December 2012 when Defra announced that up to £5 million was being made available to fund up to 20 projects between 2013 and 2015. The scheme was open to all local authorities in England, with the intention being that the successful authorities would receive the funding through their Formula grant[6] via a Section 31 determination under the 2003 Local Government Act.

In order to be eligible for funding, the projects proposed by the authorities were expected to demonstrate (Defra, 2012):

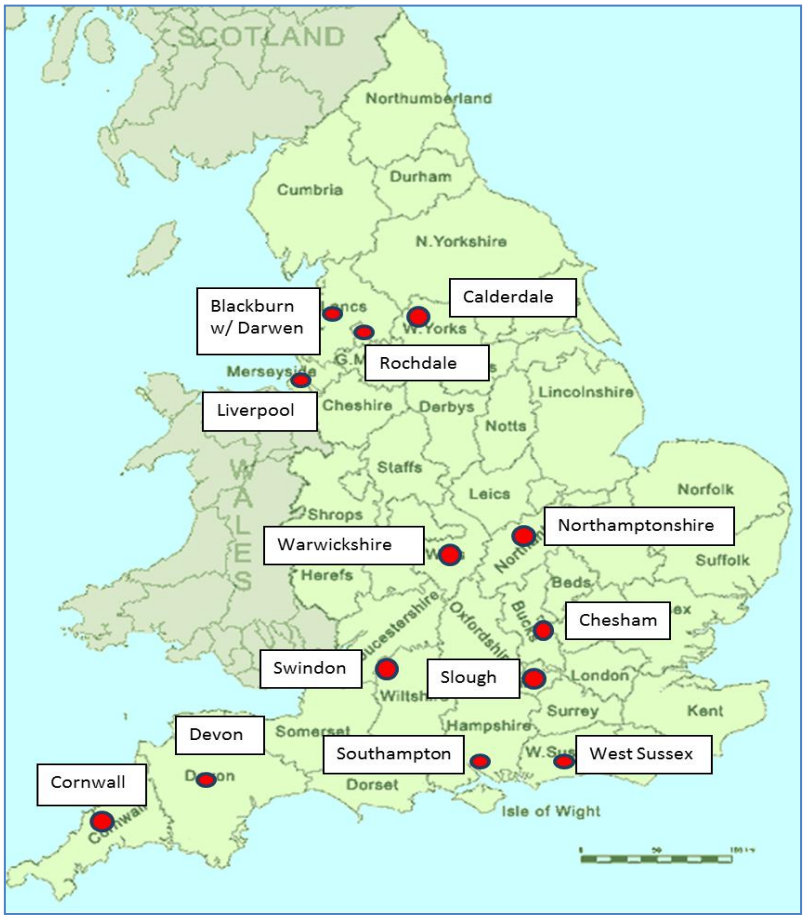
- The potential to reduce levels of flood risk in quantifiable ways.
- A focus on communities at significant or greater risk of flooding from fluvial or tidal sources, or where surface or groundwater flooding is a major problem.
- That the social groups or individuals that may be more vulnerable and that would benefit the most from engagement and support have been identified.
- That they complement other flood risk management activity already taking place, or planned for the future.

The procurement was managed through a two stage process using the Defra Bravo-Award Procurement system. A panel was set up with members drawn from the Environment Agency, the Civil Society Advisory Board and the Defra Flood Management team.

In total, 45 applications were received, 22 of which were shortlisted and invited to submit further information. In the selection process, an attempt was made to achieve a good spread across geographic locations, types of local authority lead[7], socio-demographic characteristics, number of beneficiaries,[8] previous experiences of flooding[9], sources of flooding[10], levels of flood risk, and interventions to build community resilience to flooding[11].

[6] LLFAs receive part of their funding for flood and coastal erosion risk management under formula grant arrangements administered by the Department for Communities and Local Government.
[7] Types of local authority lead include: metropolitan districts, unitary authorities and county councils,
[8] The size and number of participants range from projects which cover less than 40 properties (e.g. Southampton) to those that cover a whole county (e.g. Cornwall).
[9] The communities involved include previously-flooded communities and communities where residents have no experience of flooding and may not be aware that they are at risk of flooding.
[10] Sources of flooding include: fluvial, coastal, surface water.
[11] All the pathfinder projects included between three and eight different strands of activities; none carried out the same combination of activities.

From the 22 shortlisted applications, the panel agreed that proposals submitted by the following authorities should be funded: Blackburn; Calderdale; Chesham (Buckinghamshire); Cornwall; Devon; Rochdale; Slough; Swindon; Warwickshire; and West Sussex. Figure 2.1 shows the locations of the funded projects.



Source: www.picturesofengland.com

Figure 2.1: Location of Defra's 13 Flood Resilience Community Pathfinder projects

Pathfinder project sketches

For context and to show the starting point of each of the pathfinder projects, this section provides a brief description of each of the pathfinder project areas, aims and activities. Data in the descriptions is taken from the pathfinders' original project plans.

The pathfinder projects defined the boundaries of the communities they were working with, including: a few streets, a housing estate, part of a town or borough or a whole county. In countywide pathfinders, project actions were being implemented in specific communities, but the area of influence was the county. An overview of the pathfinder projects, including the area of influence and the scale at which community resilience data was collected for each pathfinder project is shown in Table 2.1.

Table 2.1 Overview of the pathfinder projects

Pathfinder project	Local authority lead	Area of influence	Amount of funding allocated	Type(s) of flood risk	No. of specified communities / properties targeted	Community engagement lead(s)
Blackburn with Darwen	Blackburn with Darwen council	Blackburn and Darwen	£246,047	surface water, fluvial	2 communities	Local authority
Calderdale	Calderdale Metropolitan Council	Calderdale Rochdale Canal and Upper Calder Valley	£310,000	surface water, fluvial	150 households (directly)	Local authority
Chesham	Buckingham shire County Council	Chesham town	£300,000	surface water, fluvial	300 properties	Local authority / NFF
Cornwall	Cornwall County Council	Cornwall county	£238,000	surface water, fluvial, coastal, sewer	8000 + properties	Local authority
Devon	Devon County Council	Devon county	£488,400	surface water, fluvial, coastal, sewer	24 communities	Local authority
Liverpool	Liverpool City Council	Woodlands estate in Belle Vale ward	£306,600	surface water	30 properties	Local authority / NFF
Northamp-tonshire	Northampton shire County Council	Northampton s-hire county	£299,150	surface water, fluvial	15 communities	Local authority / Independent
Rochdale	Rochdale Borough Council	East Central Rochdale and Heywood	£248,000	fluvial, surface water	2 communities	Local authority / NFF
Slough	Slough City Council	Slough town	£284,665	surface water, fluvial, sewer	417 properties	NFF
Southamp-ton	Southampton City Council	St Denys ward	£472,000	surface water, coastal	39 properties	NFF
Swindon	Swindon Borough Council	Swindon East Locality borough / wards	£278,310	surface water, fluvial, reservoir	20,000 properties	Local authority / NFF
Warwick-shire	Warwickshire County Council	Warwickshire county	£251,300	fluvial, surface water	10 communities	Local authority / NFF

Pathfinder project	Local authority lead	Area of influence	Amount of funding allocated	Type(s) of flood risk	No. of specified communities / properties targeted	Community engagement lead(s)
West Sussex	West Sussex County Council	West Sussex county	£298,500	surface water, coastal	780 households / 68 parishes/ districts	Local authority / NFF

Blackburn with Darwen

Blackburn with Darwen Borough Council is a unitary authority in North West England with a population of 147,489 (2011 UK Census data). It comprises the major town of Blackburn, a key sub-regional employment centre and transport hub, and the small market town of Darwen to the south. Both are located within a valley through which the River Darwen (Darwen) and the River Blakewater (Blackburn) flow, mostly in culverts through the centre of the towns. Both towns are susceptible to rapidly rising flood waters from surface water runoff from the valley sides and from the rivers. Flood waters usually recede quickly, but can nevertheless cause substantial damage to infrastructure and property, disrupt transport and business and affect the lives of the communities within the towns. Darwen is categorised as a Rapid Response Catchment by the Environment Agency.

During recent years, possibly due to changes in weather patterns, the area has suffered from severe flooding. In the summer of 2012 both towns experienced several flash flooding events in quick succession. Across the borough 96 residential properties, seven industrial units and two public buildings were flooded. The Environment Agency estimates the number of properties in the Borough at risk of flooding as 1estimates,842.

The pathfinder aimed to focus on improving the community's resilience to flooding by increasing awareness and information about flood risk and its management, promoting community action by encouraging the formation of community flood groups, the development of community flood plans and community resilience champions and facilitating actions such as 'gully watches' and clean up events. The pathfinder also aimed to increase economic resilience by providing information and advice on flood insurance and by working with local businesses.

Calderdale

Calderdale is an area of narrow, steep sided valleys with very little flat land. The main communities have been established in the Upper Calder Valley in close proximity to the main waterways: the River Calder, and its tributaries, and the Rochdale Canal.

The Upper Calder Valley was severely affected by flooding in summer 2012 affecting more than 250 businesses and 900 homes, some multiple times. The Environment Agency estimates that around 5,000 properties in Calderdale are at risk of flooding from rivers and

a further 2,000 to 3,000 properties are at risk of surface water flooding. This means that almost 10 per cent of the borough's population is at risk of flooding.

The project focused on local communities at risk of flooding, seeking to increase their capacity to respond to future flooding events, to enhance community flood risk management and preparedness and improve community and household resilience. Many households that were flooded have also been categorised as experiencing high levels of deprivation. The project explored measures to improve financial resilience, a factor of particular importance for vulnerable households and businesses, while at the same time delivering sustained improvement, which will have the potential to be applied to other areas.

Chesham

Chesham is a market town in the Chiltern Hills in Buckinghamshire, with a population of just over 21,483 (2011 UK Census data). Chesham is considered to be one of the more affluent areas within England and has a strong community spirit with a number of active volunteer groups. Flood risk encompasses areas of severe deprivation and relative affluence. Flooding can affect both residential and commercial properties. A large number of both residential and commercial properties are rented from private landlords and there is known to be a high turnover, particularly in north Chesham, so newer businesses and residents may not be aware of past flooding and future risk. The north Chesham area is further characterised by a mixture of ethnic groups

More than 2,000 properties in Chesham are at risk of flooding from surface water runoff. It is estimated that 35 per cent of properties in the town are at risk from a combination of surface water, groundwater and river flooding. There have been several instances of properties flooding over the past 15 years as well as incidents of extensive road flooding. However, the high turnover of ownership of commercial properties and large proportion of rented homes probably contributes to the low levels of awareness of the risk of flooding. The area at highest risk is in north Chesham. There are a number of active community and volunteer groups in the area.

The project targeted all of the town's residents as part of its awareness-raising activities. The main focus of the project, known publicly as 'FloodSmart', was to create awareness of flood risk. Activities included: providing information and help towards installing water butts and permeable paving to reduce water runoff, carrying out personalised flood surveys, setting up a community flood action group, developing an 'Aquaprint' to identify the opportunities and constraints of the planning process for flood management. Some of the project's activities were targeted more specifically at the properties most at risk of surface water flooding, which are approximately 300 properties situated along the culverted Vale Brook that runs through the town. The culvert has limited capacity and one element of the project involved reducing runoff into Vale Brook through measures including the creation of household rain gardens and the installation and planning of highway drainage improvements.

Cornwall

Cornwall is a peninsula situated at the south-western most tip of Britain with a population of 532,300 and 230,400 households in the area (2011 UK Census data). Tourism, farming and fishing are the major economic activities in the area.

Cornwall experiences flooding of many different types: coastal, fluvial, surface water, sewer, tidal and flooding from watercourses affected by tide-locking. Cornwall experienced widespread flooding in 2010 that affected more than 300 properties in 15 communities. In November and December 2012 a further 200 were impacted, many for a second time. Communities affected in 2010 responded by establishing flood groups consisting of volunteers who provide support before, during and after flooding. In January 2012 more than 30 communities and Cornwall Council came together to form the Cornwall Community Flood Forum (CCFF) to capture and share the learning they experienced in recovering from flooding.

Cornwall Council has worked with CCFF on the pathfinder project in order to enable the organisation by supporting a network of active volunteers and community groups throughout the county and also to develop strategies that can be adopted by any community. Through the work packages the project aimed to increase personal, community, financial and physical resilience and help households, businesses and communities prepare for potential flooding within the case study communities. Rather than fund capital projects to reduce flood risk, the project placed emphasis upon building experience and skills within Cornwall Council and promoting sustainable resilience within communities using low-tech, low-cost initiatives that can be reproduced easily within any community.

Devon

Devon has a relatively low population density, compared to other parts of England. The main economic activities are tourism and agriculture. Levels of income and deprivation vary across the county, with the lowest incomes and highest levels of deprivation found in the two coastal municipalities of Plymouth and Torbay.

The main sources of flood risk in Devon include: coastal flooding (storm surges, high tides and sea wall breaches from strong waves); river flooding from the large number of rivers and streams that cross the county; and surface water, sewer and groundwater flooding.

The project, which involved three LLFAs (Devon County, Torbay and Plymouth City), focused on Rapid Response Catchments where minimal or no advance warning is currently given for flooding. A priority list of 24 high-risk communities was established in partnership with the three LLFAs and the Environment Agency. The aim of the resilience measures within this project was to provide those communities with the knowledge, skills, equipment and training to help themselves in the immediate response to the onset of flooding. In the first instance, community engagement was to be established to assist in the production of a community-level action plan with a particular focus on flood risk. A number of installations including flow monitoring, rain gauging, alarms and warning signs

were to be provided, where appropriate, to assist delivery of the plans. A web-based monitoring system was to be provided to enable real-time assessment by the communities. Further provision of local sandbag stores, flood gates or barriers and in some cases individual property-level protection and minor flood defence improvements were considered to ensure the communities have the essential equipment for implementing their flood resilient measures.

Liverpool

Liverpool is the most deprived local authority area in England according to the 2010 Index of Multiple Deprivation. The target audience for the project were the residents and businesses of the Woodlands Estate in Belle Vale ward. The estate forms a discreet and isolated community with a number of vulnerable residents. Purpose built in the early 1970s, the estate has not benefited from broader investment since that time and is now one of the most deprived wards in Liverpool.

Liverpool is at very high risk of surface water flooding in comparison with other areas of the UK. Flooding is also one of the most significant risks for the city: four out of the seven very high risks on the Merseyside Community Risk Register are flood related.

The project built on the success of recent smaller schemes across the city. The focus was on providing property level protection (PLP) for properties along the boundary of Netherley brook. Six properties had already had PLP installed and the project intended to provide protection for an additional 30 vulnerable properties. The project aimed to increase the general resilience of the wider estate and facilitate behavioural change within the community through a programme of community engagement. It was hoped that the community engagement model would be replicated by other communities in Liverpool.

Northamptonshire

Northamptonshire has a number of towns of varying size and character combined with rural areas and an extensive network of rivers and canals. Flood risk comes from a range of different sources and is widespread across the county. The unpredictability and the usually rapid onset of surface water flooding means that a formalised response is not always possible. During one weekend in November 2012, 128 properties were flooded across Northamptonshire predominantly as individual properties or in small groups. The direct beneficiaries for this project were fifteen communities at the highest risk from surface water flooding. These communities were diverse in their makeup with a number of deprived urban communities and more affluent rural communities.

The overall aim of the project was to develop a community flood risk tool kit to facilitate improvements in resilience and preparedness in communities at risk of flooding. The toolkit was intended to define a coherent and effective pathway for any community (urban or rural) to enhance their own resilience. The initial phase of the project involved conducting detailed risk and resilience analyses of the priority communities in order to shape specific implementation plans, establishing the baseline for evaluation and deciding the methods

and principles to be applied in other project activities, including: establishing community flood forums, producing community flood plans and creating a community flood resilience web portal.

Rochdale

Rochdale borough is one of the most deprived areas of the country, characterised by an ethnically diverse and transient population of 211,700 people (2011 UK Census data) and a percentage of households with a person with a long term problem or disability (30 per cent) that is higher than the national average (26 per cent).

There have been flood events causing damage to properties in 2004 and 2006. Flooding and its effects are of serious concern within these communities, but awareness of and acceptance of that risk is perceived as mixed.

The project aimed to work with communities at significant risk of flooding in two areas, Heywood and East Central Rochdale, where there are specific issues of multiple deprivation, environmental quality and demographic characteristics that may impact on their ability to address flood risk. In each community, the project aimed to establish a robust community baseline as an initial core task identifying key demographic and environmental characteristics and an overview of flood risk and parts of the community at significant risk. This enabled specific targets to be identified as priorities for engagement work.

Slough

Slough is a primarily urban borough to the west of London with an ethnically diverse and transient population of 140,200 people (2011 UK Census data), with significant deprivation, high numbers of houses of multiple occupation (HMOs) and ‘Slough Sheds’ (tenants living in unauthorised outhouses and garages (Slough Borough Council, 2014)). One third of Slough residents were born outside the UK. Residents include a high proportion of young professionals looking for cheaper accommodation in reach of London and significant numbers of people living in deprived areas.

Parts of Slough have been affected by fluvial flooding over recent years, and there are issues relating to sewer and surface water flooding. The direct beneficiaries of the project were the residents of 417 properties who are both at significant risk of flooding and within the 30 per cent most deprived areas of the UK. These properties are located within three distinct areas of Chalvey, Manor Park and Wexham Court. The wider beneficiaries were primarily the remaining 2,065 properties at significant risk of flooding, but who reside in less deprived areas of Slough, and to a lesser extent the general Slough population who may have benefited from environmental improvements and improvement in community cohesion.

The project aimed to set up flood actions groups in communities in the Manor Park and Chalvey areas. Providing PLP to key properties that have been repeatedly impacted by flooding was one of the important aspects of the project. Some of the activities included

direct interaction with the residents and organising multi agency meetings. Creation and distribution of flood information to households or businesses was seen as important to improve community understanding of the level of flood risk and options available to reduce that risk.

Southampton

Located on the south east coast of England, Southampton is the largest city in Hampshire. The pathfinder focused on 39 residential properties in the lower Priory Road / Adelaide Road, in the area of St Denys which is in the Portswood ward of Southampton city. Portswood ward has a population of 14,831 (2011 UK Census data) and is the second most densely populated part of Southampton. It is also home to many students. The two roads focused on by the pathfinder have a mix of housing with 26 privately owned, nine privately rented and three social housing properties. The 39 residential properties were identified within the significant tidal risk area (1 in 50 year flood zone) in the Southampton Coastal Flood and Erosion Risk Management Strategy (2012).

The project aimed to engage residents in the two roads with a view to implementing PLP measures as well as increasing understanding of the interactions between groundwater, tidal and surface water risk in the area. The activities included: commissioning a study to examine the flood risk interactions; engaging residents to raise awareness of flood risk through specific events and also by going to existing community groups; establishing a residents group to discuss flood risk issues; implementing resistance or resilience measures tailored for the properties and improving longer term resilience through establishing a community flood action group, development of a community flood plan and appointment of flood wardens.

Swindon

Swindon is a large town within the Borough of Swindon and as of 2011, the population of the built-up area of Swindon was 185,609 (2011 UK Census data).

Swindon is at risk of surface water, fluvial and reservoir flooding. In heavy rainfall events the existing drainage network has capacity problems. This has resulted in parts of the sewerage network causing localised flooding. Since the floods in 2007/2008, Swindon Borough Council has been taking remedial action to alleviate flooding and working with partners to collect data to map flood risk and vulnerable groups.

The pathfinder intended to develop a network of Community Flood Champions (CFCs) to work across Swindon targeting areas of social and financial deprivation, hard to reach groups, vulnerable people and small and medium sized enterprises. The CFCs comprised members of the community with an interest in flooding and who wanted to help their communities to be resilient by knowing about their flood risks, how to prevent them and what to do in the event of a flood. The project focused on Swindon’s East Locality which covers an area at flood risk, five communities within the ten per cent most deprived areas

of England and an ageing population. While the area is at risk of flooding, the majority of residents had no prior experience of flooding.

Warwickshire

Warwickshire is located in the West Midlands and has a population of approximately 545,000 (2011 UK Census data).

Frequent flooding events have occurred across the county and this has led to the formation of community flood groups, for example, in Kenilworth. The biggest flood events in recent history occurred in April 1998 and July 2007, with numerous other smaller events in the last 15 years. It is estimated that around 565 properties flooded in Warwickshire in April 1998, with an approximate associated cost of between £15 million and £20 million, and around 1,840 properties flooded in July 2007, with an approximate cost of between £50 million and £70 million. In November 2012, 165 properties were affected at an estimated cost of between £1.3 million and £4 million.

The project aimed to establish a community flood action group in each of the ten communities participating. These groups were then to be encouraged to develop flood emergency plans and to suggest mechanisms/technologies to increase local resilience to flooding. Countywide engagement was intended to promote awareness of flood risk and provide both information and ‘grab bags’ to members of the public. Engagement activities with schools near to the ten communities involved in the project were to be undertaken, with rain gauges installed to complement their teaching curriculums and an ambition that these activities would lead to children informing parents and raising their flood risk awareness.

West Sussex

West Sussex is located on the south coast of England, with a population of 806,900 (2011 UK Census data). In the last ten years, the county has seen a seven per cent increase in its population. Since 2001 there has been an increase of those aged over 65 and over 85 in West Sussex of 13,750 and 3,437 respectively. West Sussex is classified as being ‘significantly rural’ according to Defra. 42 per cent of the county’s resident population and more than half its businesses are located in rural areas. 19 wards in West Sussex fall within the ten per cent most deprived nationally and are targeted through this project along with other parishes across West Sussex.

In June 2012, West Sussex suffered exceptionally heavy rainfall which led to internal flooding of 780 properties. The areas affected were concentrated along the coastal strip and in amongst the areas of greatest deprivation nationally. This was primarily a surface water flood event for which no real time property level warning systems existed. West Sussex County Council (WSCC) developed an action plan to address identified deficiencies across at risk areas and affected communities were engaged with very early on by a multi-agency partnership.

The aim of the pathfinder project was to provide a focus to merge these initiatives, take the best practice from each of them and develop them further into a more coherent, integrated approach. The project had a number of strands: to develop resilience to flooding amongst parish councils and small businesses; engagement of residents through flood groups; installation of PLP in 40 highest risk properties in the most deprived areas; gather evidence around insurance; and to capture and disseminate learning from the project. The activities for this project included: awareness raising workshops with parish councils, community engagement in at risk areas, surveying for and installing PLP.

3. Conceptual Framework: Community Resilience

This section is developed from the *Flood Resilience Community Pathfinder Evaluation Rapid Evidence Assessment* (REA) (Twigger-Ross *et al.*, 2014) published by Defra in 2014.

The REA's comprehensive review of relevant literature directly informed the evaluation framework and choice of indicators for the scheme evaluation (see section 4). By clarifying what community resilience, and what a change in community resilience, looks like in practice, it also helped support the pathfinder project managers to improve and develop their own evaluation criteria.

Understanding community resilience

The term 'resilience' has entered into common use within the world of disasters in general over the past two decades and gained increased prominence after Hurricane Katrina in 2005 and entering into UK government language around emergencies with the publication of the Civil Contingencies Act (2004) and the setting up of Local Resilience Forums. It came to prominence specifically with respect to flooding after the 2007 flood (Pitt, 2007) followed with work around community resilience by the Cabinet Office (Strategic National Framework on Community Resilience, 2011). Across the academic literature although there are a number of definitions with varying emphases there is a consensus that resilience is a multi-faceted concept (Cutter et al, 2010). DFID (2011: 6) provides a useful definition of resilience, from a disaster perspective that covers a number of the key aspects that are discussed within the literature:

> *Disaster resilience is the ability of countries, communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses – such as earthquakes, droughts or violent conflict – without compromising their long-term prospects.*

This definition together with the DFID model of disaster resilience (see Annex 10 for details) as discussed within the REA draws out the multi-dimensional nature of resilience and specifically, it highlights the possibility of transformation of communities so that risks can be better managed or lived with.

Further, it frames resilience as a process and asks the key questions: 'Who or what is the focus of resilience?' and, 'What is the stress or shock?' that 'countries, communities and households' are being resilient to. For the pathfinders the focus is on "communities". The emphasis goes beyond individual behaviour change to include the resilience of social networks and institutions relating to flood risk management. In terms of the shock or stress the pathfinders have implemented actions to build community resilience to prepare for the shock of a flood and to alleviate potential long-term stresses that cause flooding. Resilience has been focussed at different sub-national levels, depending on the area of

influence defined by the pathfinder: some are aiming to influence countywide; some are focussed at a lower spatial level (village, town, etc.).

Refining the definition further and thinking more about community resilience in the context of emergencies in the UK in particular, the following definition which adapts the Cabinet Office definition of community resilience[12] is a useful articulation of what the pathfinders were aiming for within their projects:

> *Communities working with local resources (information, social capital, economic development, and community competence) alongside local expertise (e.g. local emergency planners, voluntary sector, local responders) to help themselves and others to prepare and respond to, and to recover from emergencies, in ways that sustain an acceptable level of community functioning* (adapted from Twigger-Ross *et al.*, 2011: 11)

This broadens the Cabinet Office definition to cover the whole risk management cycle (preparation, response and recovery) and focuses on what is important to maintain: a functioning community, everyday quality of life.

This definition also draws attention to the issue of capacities that exist within communities which provide the foundation for resilience within the disaster/emergency situation. Response and recovery is built using pre-existing community capacities, which are expanded or extended in line with a – perhaps dramatically – identified need (Dynes, 2005). Cutter *et al* (2008; 2010)[13] call these capacities "inherent resilience" and they form part of their Disaster Resilience of Place model:

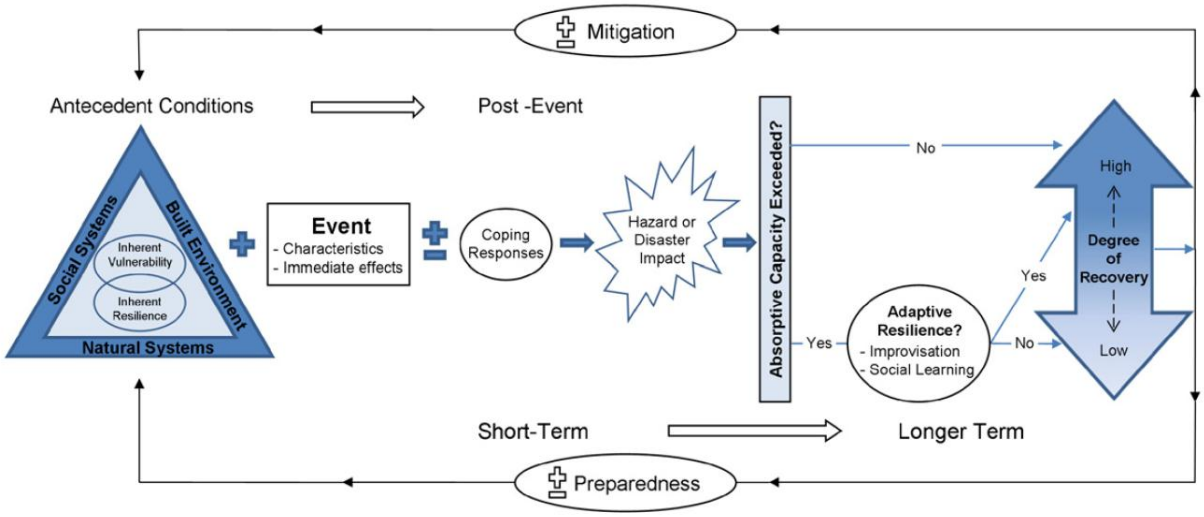


Fig. 3.1 Schematic representation of the disaster resilience of place model (Cutter *et al*, 2010, p.602)

[12] Referred to in the Strategic National Framework on Community Resilience (2011) "Communities and individuals harnessing local resources and expertise to help themselves in an emergency, in a way that complements the response of the emergency services." (Civil Protection Lexicon, 2010)
[13] For more details on this see Cutter et al, 2008 and their Disaster Resilience of Place model and for a summary the REA.

The Cutter *et al* (2010; 2008) framework was chosen for the evaluation because it is theoretically driven, drawing on all the seminal academic papers in the area of resilience whilst also being translated into measurable indicators.

> *This paper utilizes the inherent resilience portion of the disaster resilience of place (DROP) model (Cutter et al. 2008b) as its conceptual basis. The DROP model presented the relationship between vulnerability and resilience in a manner that is theoretically grounded and amenable to empirical testing. Furthermore, the DROP framework explicitly focused on antecedent conditions, specifically those related to inherent resilience. (p.5 Cutter et al, 2010)*

Five categories of community resilience are provided within the Cutter *et al* (2010) paper[14]: social, economic, institutional and infrastructure resilience, community capital. These categories relate to how communities 'engage' with (i.e. prepares for, withstands, responds to, and recovers from) disasters taking the view that: *"Here resilience is as a set of capacities that can be fostered through interventions and policies, which in turn help build and enhance a community's ability to respond and recover from disasters" Cutter et al, 2010 p.2).* For the evaluation these categories have been interpreted into the specific context of flooding.

Box 3.1: Vulnerability and resilience

There is quite an extensive literature on social vulnerability in relation to climate change (e.g. Twigger-Ross and Orr, 2012), disasters (e.g. Cutter *et al*., 2008) and natural hazards (e.g. Tapsell *et al*., 2010). This review does not intend to review that work comprehensively but rather to provide a summary of the key issues and more importantly its relationship with resilience in general and its role in flood risk more specifically. Interestingly, social vulnerability was a key term discussed in relation to social issues and flooding in the UK until fairly recently (e.g. 2012) when the rhetoric has moved towards resilience, and using resilience in a context to mean more than structural resilience. As a concept it is related to resilience with some authors suggesting it is the opposite of resilience with others taking a more nuanced view that a person/community can be vulnerable yet also be resilient because s/he has capacities to adapt or overcome that vulnerability: "*The main output of long discussions, readings and reflection is that resilience cannot be simply considered as the —flip-side of vulnerability. In other terms, a resilient community is not just a community manifesting low levels of vulnerability*" (ENSURE, 2011: 12).

Work on social vulnerability and flooding has been carried out over a number of years now in the UK and so findings on what makes people more vulnerable to flooding at the individual level are becoming quite well established. Conversely what makes people resilient to flooding is less well established. In discussing vulnerability it is important to be clear about how it relates to resilience and how we are using it within this review. Cutter *et al.* (2008) provide a very useful review of the different ways in which vulnerability and resilience have been conceptualised. We are not going to rehearse those discussions here but rather to say that we take Cutter *et al.*'s (2008: 602) view:

Contrary to some conceptualizations where resilience and vulnerability are oppositional, we propose that there is overlap within these concepts [vulnerability and resilience] so that they are ***not totally mutually exclusive, nor totally mutually inclusive****. There are many characteristics that influence only the vulnerability or only the resilience of a community. On the other hand, there are social characteristics that*

[14] It should be noted that in Cutter et al 2008 there is another category: ecological resilience but this was excluded "*due to data inconsistency and relevancy when developing proxies for ecological systems resilience for large and diverse study areas*"

influence both vulnerability and resilience (socio-economic status, education, and insurance, for example). (from REA, p.39)

Social resilience: This category is based on the current and potential capability of individuals to engage with flooding within a community. For example, "*communities with, fewer elderly, disabled residents, and non-native speaking residents likely exhibit greater resilience than places without these characteristics* (Cutter *et al.,* 2010: 8). These characteristics are some that have been shown to exacerbate negative impacts of flooding[15]. This category links closely with much of the work that has been carried out on social vulnerability in the context of flooding which is discussed further in the REA (see Box 3.1). However, this evaluation considers that social vulnerability of communities to flood risk is not just the opposite of community resilience to flood risk. It is possible for a person to be vulnerable to flooding e.g. by having a lack of mobility, yet resilient in the context of a flood because she is part of a network of people who can provide necessary help during a flood.

Community capital: This category focuses on the existing networks and relationships within the local area. It "*embodies what many refer to as social capital. We attempt to capture three key dimensions of social capital: sense of community, place attachment, and citizen participation"* (Cutter *et al*., 2010: 8). For example, knowing neighbours, informal help given / received and number of community groups belonged to. Evidence suggests this is the 'glue' that keeps communities together and provides the foundations upon which community flood resilience can be built. Box 3.2 provides some discussion of the concepts of social capital. In this evaluation, bonding (close bonds between family and friends) and bridging (looser networks between different groups) social capital will be discussed within community capital with linking capital (between citizens and local authorities) discussed within institutional resilience.

Economic resilience: This category refers to the economic vitality of both individuals and the community, including housing capital and ownership, equitable incomes, employment and business sustainability. For the purpose of this evaluation, the focus has been on financial resilience, and in particular, on the availability and extent or cover of flood insurance, to enable individuals, and the communities of which they are part, to cope with the impact of flooding. Evidence shows that having greater financial resources can increase resilience to flooding.

[15] See Table 8, p.44-45 of the REA

Box 3.2: Networks and social capital

Networks are an essential part of any community. These networks may take many forms at a whole variety of scales and may be mediated by technology as well as being face-to-face. There is ample evidence within the disaster literature of people helping one another during and following a crisis situation (Fernandez-Bilbao & Twigger-Ross, 2009; Pitt, 2008). There is also evidence that these networks may be created or reinforced through the experience of the emergency situation in a phenomenon known as the therapeutic community (Flint and Luloff, 2005; Fritz, 1961; Gurney, 1977; Tapsell *et al*., 1999). However, they may also be damaged and there may be division, in what has been termed the corrosive community (Erikson, 1994; Freudenberg, 1997). It is clear that networks will be called upon if there is to be some form of resilience. Correspondingly, disruptions to the existing support networks by floods or by the removal of people to temporary accommodation have been shown to reduce resilience (Buckle et al., 2000; Fordham, 1998). Recent research suggests that although help is often willingly given by local people, at least in the immediate crisis situation, this is dependent on the existing network structures. Help is more widespread, collective and organised where networks are dense and interlinked and there already exists a culture of working together (Coates, 2010). A key way in which networks have been conceptualized is through the concept of 'social capital'. Putnam (2000) has introduced the categories of bonding, bridging and linking social capital to explain different types of networks, but as Deeming (2008) in his work in three coastal communities concludes " *merely having social capital in a community does not mean that it is readily instantiated into any form of hazard resilience"p.295.* The table below summarises the key characteristics, together with opportunities and risks in the context of emergencies.

Type of social capital	Key characteristics	Good for…/ Opportunities	Bad for…/ Risks
Bonding: "super-glue"	Close knit, often based on familial or friendships ties	Support in emergencies within network, sticking together	Can be exclusive, may not be linked to wider resources that are needed to cope within an emergency
Bridging	Looser networks	Bringing people involved in different groups together providing access to wider resources	May not be able to respond quickly. May only offer very narrow types of resource based on the type of relationship (the interest). Unlikely to provide emotional support
Linking	Hierarchical networks between people in local areas and organisations with power and influence	Engendering collective action	Can become rule bound over formalised and potential for manipulation by those in power

(from Twigger-Ross *et al*, 2011 p.18)

Institutional resilience: The category is focussed on what institutional arrangements and experience are present within the community in relation to flooding. '*Here, resilience is affected by the capacity of communities to reduce risk, to engage local residents in mitigation, to create organisational linkages and to enhance and protect the social systems within a community (Norris et al., 2008)*' (Cutter *et al*., 2010: 10).Institutional resilience focuses on the development of institutions, both formal and informal to support improved flood risk management. It includes both new institutions (e.g. flood group, flood group networks), as well as activities that help to build resilience within and between existing institutions (e.g. multi-agency meetings, community flood plans, resilience groups within Parish councils). Broadly, it refers to the governance of flood risk management.

Box 3.3: Governance

The concept of governance considers the institutions, bodies or organisations involved in decision-making processes to consist of more than just 'government'. It may consist of a wider range of formal and informal bodies. The broader literature on governance, from the social sciences, recognises that initiative and decision making processes do not take place exclusively at the state level but within an increasingly pluralistic structure of agents at different spatial scales. According to the concept of governance, actors do not consist of exclusively government bodies but may include private sector business, community organisations, voluntary sector bodies and other NGOs, as well as influential individuals. The concept of multilevel governance suggests that governance takes place through processes and institutions operating at a variety of geographical scales including a range of actors with different levels of authority (Hooghe and Marks, 2003).

Infrastructure resilience: This category is 'mainly an appraisal of community response and recovery capacity and the extent to which physical infrastructures that house, transport and produce goods and services for society may be particularly vulnerable to sustaining damage and likely economic losses' (Cutter *et al*., 2010: 9). This is taken together with any actions that communities take to increase their resilience to flooding through physical measures (e.g. property-level protection measures, flood storage, highway drainage).

This report discusses the pathfinder interventions in terms of these five resilience categories. The REA highlights the need to understand resilience as a complex and multi-faceted concept. Breaking it down into these categories has made it possible to pinpoint which aspects of resilience the pathfinder interventions have targeted. The REA suggests that classifying resilience in this way would also support the development of measures to assess the effectiveness of the interventions in the context of resilience.

The five resilience categories were used to develop indicators of community resilience to meet the research objectives of the evaluation and have helped the pathfinder projects to capture and describe their interventions in the context of resilience (for further details, see section 4: Methodological Approach).

4. Evaluation Framework

Introduction

The previous section sets out the concepts and understandings of community resilience which inform the evaluation. This section describes the evaluation framework, including the methodological processes and techniques employed to:

- develop a model of the project or intervention as a causal chain of actions and consequences (logic model);
- collect, synthesise and analyse qualitative and quantitative data at the baseline, interim (Year 1) and end of project (Year 2) stages; and
- establish a baseline and a 'counterfactual' (or the future situation in the absence of the intervention) against which change can be measured.

The evaluation was conducted at two levels: *project a*nd *scheme*-level. This involved a secondary review of information provided by each of the projects alongside primary research with those involved in the scheme overall. With a focus on understanding how interventions at the local level can contribute to increasing community resilience, the evaluation combined the three types of evaluation identified by the HM Treasury's (2011) *Magenta Book*, each of which serves a different purpose:

1. **Impact** – what has changed (in terms of both behaviour and flood risk) and how much change has occurred as a result of the interventions
2. **Process** – what has worked or what has not worked, and why
3. **Economic** – the evaluation considers the benefits (economic and non-economic) of the interventions for participants at three levels:
    - individual beneficiaries
    - local authorities
    - national government (i.e. Defra, as the funding authority).

As stated in section 2, the pathfinder projects were intentionally characterised by their diversity, and this extends to their approach to project evaluations, which in some cases were contracted out to external agencies, such as universities, with their own methodologies and tools (see section 5 for further details of project evaluators). The scheme evaluation began in July 2013, three months after procurement of the pathfinder projects. Therefore, by this time the projects had already invested resources into designing evaluation plans and the evaluation team sought to work with the projects' evaluators to understand the approaches being developed, and, as far as possible, build on this work in designing methodologies and tools for the scheme evaluation.

Evaluation framework

Using a logic model to evaluate elements of an intervention

A logical framework provides a way of understanding the relationships between components of pathfinder projects or interventions and in particular, what components are required to achieve the desired outcomes and impacts. The value of using a logic model for evaluation is that it ensures that the issues are examined in a systematic way.

At the development stage of the individual pathfinder projects, lead organisations were asked to present their proposals in the framework of a logic model. This was to show how the requested funding (input) would be used to implement activities that would provide outputs to increase community capacities to understand, address and respond to flood risk (outcomes) and in the long term reduce the damaging impacts of flooding (impacts).

The evaluation has sought to go beyond a simple assessment of what happened and what was achieved to explore questions about ***why*** and ***how*** changes happen, as reflected in the objectives and purposes described in section 1 and the introduction to this section. As a result, the evaluation objectives led to a new set of questions about interventions, interrogating the causal relationships.

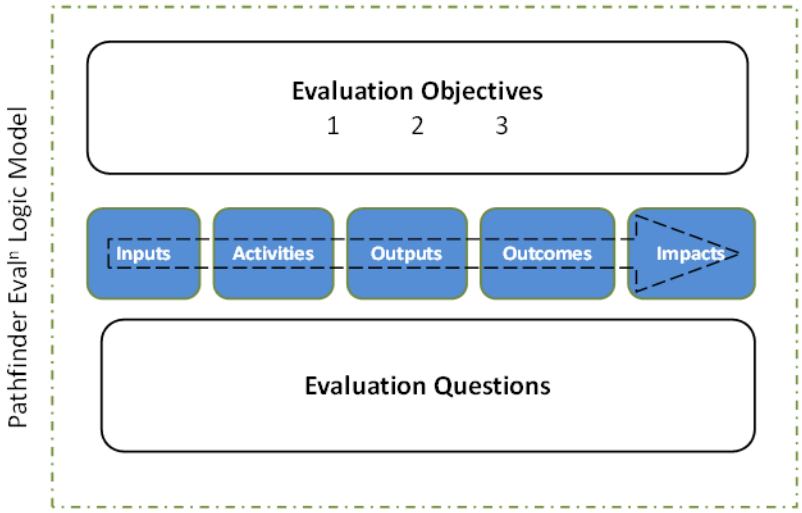


Figure 4.1: Pathfinder evaluation logic model

The logic model has enabled assessment of the extent to which the overall objectives have been achieved, the contribution of individual components, and the results. This evidence of the changes produced in individual interventions has been strengthened by the possibility of comparison with other pathfinder projects which have carried out the same or similar interventions.

Using a Theory of Change to understand causal relationships and assumptions in interventions

> *'Theory of Change is a systematic and cumulative study of the links between activities, outcomes, and context of an intervention. It involves the specification of an explicit theory of how and why an intervention might cause an effect which is used to guide the evaluation. It does this by investigating the causal relationships between context-input-output-outcomes-impact in order to understand the combination of factors that has led to the intended or unintended outcomes and impacts. Theory of Change therefore tests, and normally develops the implementation theory of an intervention and allows this to be modified or refined through the evaluation process.' (DfT, 2010)*

The Theory of Change approach requires the assumptions underlying the expectations of the outcomes and impacts of an intervention to be made explicit (DfT, 2010). The exercise of making assumptions explicit sometimes suggests the possibility of alternative outcomes (risks) or the existence of alternative pathways to the same outcomes (opportunities). Most importantly, it makes both practitioners and evaluators recognise the multiple contextual and procedural factors that may influence the progress and results of any intervention and to make allowances for this complexity in their project and evaluation planning. Opening up to the potential for different outcomes creates space for learning and feedback loops.

Using a Theory of Change approach has provided the following benefits for the scheme evaluation:

- It brings out the assumptions of both practitioners (pathfinder project teams) and evaluators, so that these are recognised as hypotheses that could be tested through the evaluation;
- It recognises the multiple factors that influence change and the potential for change to take different pathways. This has encouraged all those involved to be open to interventions developing in new ways, rather than feeling obliged to stick rigidly to an established plan; and,
- It moves away from the polarities of 'success' and 'failure', to focus the evaluation on how and why interventions result in change and the nature of the changes generated. It is suggested that these insights are likely to be more useful in developing interventions in other locations and contexts than a measure of the 'success' of the intervention would be.

Establishing the counterfactual

The *Magenta Book* (HM Treasury, 2011: 19), emphasises the importance of a 'counterfactual', that is, being able to compare the impact of a policy with what would have happened in the absence of that policy. The same applies to the assessment of the impact of interventions. One way of establishing what would have happened in the absence of an intervention is to use 'comparison groups': similar types of people/places who will not be

exposed to the intervention and who are surveyed before and after the intervention to see what change(s) would have happened without it. However, a key aspect for the comparison groups approach to work is for the intervention to be randomly allocated.

The following characteristics of the pathfinder projects placed certain limitations on the evaluation and the methods available for an assessment of the counterfactual:

- Pathfinders were selected by Defra to meet a specific set of criteria.
- The context, objectives, scale, activities and outcomes of the Pathfinders are very diverse, as intended by Defra.
- The pathfinders lacked relevant historical baselines which meant it has not been possible for a detailed before-after indicator comparison.

These specific characteristics meant that it was not possible to identify control groups with similar characteristics to use as the counterfactual for the pathfinder initiatives.

Pathfinder project teams were also concerned that:

- Carrying out surveys could create unrealistic expectations among people who would not subsequently be involved in the scheme.
- It would be too time consuming and costly to have to survey an additional group of residents.

A simple alternative considered by the evaluation team was to develop a 'business as usual' scenario, of the kind used in economics. This assumes that current conditions continue into the future, so a projection can be made of the situation at a future date, based in current trends, for example in economic activity, housing provision, migration etc. However, the kinds of change that the pathfinder projects might have been expected to produce tend to happen at a smaller scale and have been assessed over a short time scale of only two years, so the business as usual scenario was likely to be too crude to provide a useful comparator.

In response to these challenges the evaluation has used a self-reported counterfactual assessment to provide a picture of what would have happened without the projects. A qualitative assessment has been made through data provided by project managers in answer to the question: "What would have happened without the project?" in evaluation interviews conducted at the end of Year 1 and Year 2, (see Annex 2 for interview schedules) and in Year 2 Project Evaluation Reports completed by the pathfinders. In Year 2, to draw on a wider range of viewpoints to describe factors other than the pathfinders that are influencing community flood resilience in England and the nature and extent of the changes being seen, pathfinder project managers and up to four stakeholders in each pathfinder were asked the question: '*What other factors have contributed to the successes of the project?*' Responses to both questions are used to discuss the counterfactual in section 13.

This approach set out here has a number of limitations, specifically because it relies on the views of those involved with the pathfinders, but it does allow for the evaluation to better understand the impact of the pathfinders within the identified challenges.

Data collection

A mixed methods approach utilising qualitative and quantitative social research techniques has been taken to collect, synthesise and analyse evidence for the evaluation. The report draws on and incorporates a number of data sources (collected at the community and household levels) to provide information about the impacts and outcomes generated by the pathfinder projects as well as on implementation and process. Case studies written by the pathfinder project teams are included throughout to illustrate aspects highlighted by the report. (For the list of case studies included, see page 5).

Rapid Evidence Assessment

Rapid Evidence Assessments (REA) or systematic reviews are integral to evaluations (HM Treasury, 2011) to provide the conceptual framework. They have been developed in the context of the rapid growth in quantity and availability of evidence specifically via electronic databases, together with the demand in government for transparency and accountability within evidence gathering (JWEG, 2013). REAs involve a systematic search for relevant literature guided by experts, based on:

- Clear criteria for inclusion and exclusion of documents and studies.
- Measures of quality of research.

REA have the overarching purpose to review the best available research evidence on a topic and to contribute to effective policy making. At the inception phase of this evaluation, the evaluation team conducted a REA of relevant social scientific literature on, primarily, economic and social understandings of resilience at individual, community and society levels. This was published by Defra in 2014: *Flood Resilience Community Pathfinder Scheme Evaluation Rapid Evidence Assessment* (Twigger-Ross *et al*., 2014). For the evaluation of the pathfinder scheme, the REA provides evidence to inform the categories of resilience and a comprehensive review of relevant literature with a wider scope than this project.

The REA informed the framework and criteria of the scheme evaluation and supported the pathfinder project leads to improve and develop their own project evaluation criteria by clarifying what resilience, and more importantly, what a change in resilience, looks like in practice.

The research questions the REA sought to address:

1. What does resilience mean in the context of flood risk management as a whole (preparing, responding and recovering from flooding)?

1a. What does it mean at an individual, community and society level in relation to flood risk management?

1b. What does financial resilience mean in relation to flood risk management?

1c. What does social resilience look like in practice? Are there examples of resilient communities? Drawing on findings from previous research questions (e.g. governance, scale)

2. What is known about the 'source' of resilience, i.e. how it is 'created' or built in the context of flood risk management? (main question)

2a. What are the links between (social) resilience and vulnerability in the context of flood risk management?

2b. What is the relationship between behaviours and resilience in the context of flood risk management?

2c. Does individual or shared ownership and responsibility with regard to flood risk, build resilience?

2d. What role do institutional and governance arrangements play in building resilience in the context of flood risk management?

3. What is known about interventions to build resilience at a society, community and individual scale, and their effectiveness in relation to flood risk management?

4. How could you measure resilience in relation to flood risk management?

4a. What metrics exist for measuring resilience?

Establishing a baseline

Each pathfinder project established its baseline situation at the start of the intervention which could be compared with the situation at the end of the project in order to determine the nature and extent of changes in community resilience achieved. The project baseline was used to:

- Provide information about the context in which the pathfinder intervention takes place, by describing key characteristics of the individuals and communities involved. These characteristics could influence the way in which individuals and communities respond to interventions. For the scheme as a whole, it has been important to understand these characteristics and identify differences between pathfinders.

- Analyse the results of the interventions in relation to people or groups with particular characteristics, particularly vulnerable people or communities.

The collection of baseline data was undertaken through a set of common indicators that attempt to measure the five categories of resilience (as described in section 3) at both the

household (see Annex 7) and community levels (see Annex 8). Using the same indicators for all the projects was intended to provide consistency across the data and allow comparative evaluation.

It is important to note:

- This was an experimental method developed specifically for the evaluation.
- Data for some of the resilience indicators used were not expected to change over the pathfinder period (e.g. SR1 Educational Equity). Where relevant, these have been included so that they are available for longer term measurement beyond this project as well as to provide contextual information.
- Some of the individual projects have produced their own baseline characterisation reports[16], which have provided valuable additional details.

Community level resilience indicators

Community level resilience indicator data from national data sets (e.g. 2011 UK Census) were collected by the scheme evaluation team, whilst pathfinder project teams obtained information for the remaining indicators from local data sets or other sources (see Annex 8 for details).

As described in section 2, the area of influence of each pathfinder project and as a result the scale at which data was collected ranged from ward to county-level (see table 2.1 in section 2). For some indicators, data was not available for the area of influence defined. In these cases, the closest geographical unit has been used and this is indicated, for example, for households with broadband. Year 2 data has been collected where updated data sources were available. Only eight out of the 13 projects collected community level resilience indicator data, and of those eight, only five collected data at both the baseline and end of the project.

Household level resilience indicators

Pathfinder evaluation teams collected data on household level resilience indicators at baseline and Year 2 through a survey using a set of 32 common questions (see Annex 7). As shown by Table 4.1, the pathfinder evaluation teams used a range of survey methods.

[16] Blackburn with Darwen, Rochdale and Swindon had all produced baseline characterisation reports by the end of March 2014.

Table 4.1. Pathfinder project household survey data collection methods for the baseline and Year 2

Pathfinder	Survey method at baseline	Survey method in Year 2
Blackburn with Darwen	By post and face-to-face	By post and face-to-face
Chesham	Sent out by post to residents in high risk areas (748 addresses), administered face-to-face at events and available to complete online	Sent out by post to residents in high risk areas (same addresses, minus those who did not agree to be contacted following the Year 1 survey), administered face-to-face at certain locations and available to complete online.
Calderdale	Face-to-face	Face-to-face
Cornwall	By post with a prize draw incentive to reply	By post with a prize draw incentive to reply
Devon	Varied, post, hand delivered, at events	By post
Liverpool	By post	By post
Northamptonshire	By post and online	By post and online
Rochdale	Face-to-face but limited	Face-to-face but limited
Slough	Face-to-face and post	Unknown
Southampton	Face-to-face	Face-to-face
Swindon	Face-to-face and post	Face-to-face, post, and phone
Warwickshire	Face-to-face and online	By email to respondents from baseline survey who agreed to be contacted again in Year 2.
West Sussex	Face-to-face and online	Face-to-face and online

Some of the common questions were intended to gather information on the characteristics of survey respondents' households, while others sought to understand the perceptions of individual respondents. Therefore, the report uses the terms 'individual' and 'household' level in reference to specific data, as appropriate, but commonly refers to the 'household survey' or 'household level resilience indicators'.

Interviews

The evaluation team conducted semi-structured interviews of up to one hour in length by telephone and face-to-face with all 13 pathfinder project managers at the end of Year 1 (April and May 2014) and Year 2 (March to May 2015). In Year 2 only, short email surveys were undertaken with 27 project stakeholders (e.g. representatives of community flood groups, the Environment Agency, water companies, etc.). The aims of the interviews and surveys were:

- To give the pathfinder project manager / stakeholders the opportunity to clarify, elaborate and reflect on the contents of their Year 2 evaluation report and final report;
- To enable the evaluation team to check consistency and to explore any queries they had from their reading of the pathfinder project's Year 1 / Year 2 evaluation reports and final reports;

- To enable the evaluation team to gather views of the project manager / stakeholders on:
    - The role of governance / structures to build resilience
    - What types of interventions have been more successful than others, with whom and why
    - The nature of resilience to flooding being addressed by the project
    - Community engagement
    - The counterfactual
    - Expectations for the sustainability of the project
    - Challenges of evaluation and solutions found.

See Annexes 2, 4 and 5 for interview schedules and interviewee lists.

Analytical approach

A mixed methods approach and triangulation of quantitative (household level and community level resilience indicator data) and qualitative (interviews and documentary analysis of Year 1 and Year 2 Evaluation Reports produced by all 13 pathfinder projects) data has been used as a way of verifying data.

Evidence from the various data sources were compared to help identify common themes relevant to the evaluation.

Interview analysis

An inductive (bottom-up) as well as deductive (top-down) thematic approach was used. Broadly this involved coding the data according to themes which are either already named (deductive) or emerge from the data (inductive).

Interview transcripts from the 13 interviews conducted with pathfinder project managers and 27 stakeholders (see Annex 1 for interviewee list) were imported into Dedoose, a computer assisted qualitative data analysis software (CAQDAS) package. Dedoose facilitated the management, coding and grouping of the qualitative data.

A code tree was developed before starting to code the data (see Annex 9). This included six main code headings:

1. Reflections on the evaluation methodology
2. Community resilience focus and usefulness

3. Activities and links to the five resilience categories
    a. Challenges and learning points
    b. Successes
    c. Unexpected outcomes
4. Governance
5. Counterfactual
6. Legacies

Descriptors were applied to each transcript to make it possible to filter results and make comparisons within and between pathfinder projects and types of stakeholder (e.g. Environment Agency, flood group member, parish councillor). Using Dedoose, it was possible to identify the codes that appear most frequently and to prioritise these in the analysis.

During coding, additional codes were added to capture themes emerging in the interviews (see Annex 9 for full list).

Once the data were coded, excerpts relating to a code were exported and then analysed further looking for links and relationships within and between codes across the interviews.

Document analysis

The REA took the following approach to analysis and synthesis:

- For research questions 1, 2 and 4 once the papers had been allocated to the questions the analysis started with information from the expert advisors and then drew on papers from the searches.
- For question 3 all the papers extracted were evaluated against quality criteria and data extraction forms were completed for each. Then those papers were analysed and synthesised.

As well as the REA, the evaluation draws on the Year 1 and Year 2 Evaluation Reports and Final Reports produced by the pathfinder projects. Document analysis of these reports focused on examining outcomes, testing of assumptions and economic analysis based on the same thematic codes used for the interviews.

Economic analysis

The approach to economic analysis was developed in consultation with Professor Dennis Parker (Flood Hazard Research Centre, Middlesex University, London), Olivier Vardakoulias (nef consulting) and Defra's in-house economist. The economic analysis focuses on two key areas:

- Identification of the main benefits associated with pathfinder activities (economic and non-economic).

- Using indicator data from *Flood and Coastal Erosion Risk Management. A manual for economic appraisal* (Parker *et al.,* 2013) in order to put some estimates on damages avoided due to specific pathfinder activities and to assess benefits in qualitative or quantitative terms (monetary or non-monetary).

The evaluation examined the benefits in relation to specific activities to understand the types of benefits associated with different pathfinder activities and to assess the extent to which those benefits could be monetised. To facilitate this, pathfinders were asked to complete a comprehensive activities checklist as part of their Year 2 Project Evaluation Reports. See section 4 for further details about the approach to economic analysis and assessment of the benefits.

Ethical considerations

All information provided by interviewees and survey respondents has been treated as confidential. Direct and indirect quotations from pathfinder project manager and stakeholder interviewees are used throughout the report as qualitative evidence to clarify and illustrate links between data, interpretation and conclusions. All quotations have been anonymised with the code system only known to the evaluation team (for example, '1PM', '2SH3', etc.).

Data limitations and lessons learnt

Data availability and gaps

There are significant gaps in data on key aspects related to flooding. Examples include the lack of data on: local authority spending on flooding and emergency response, emergency shelter and property insurance cover. These are aspects that it would be important to monitor over time. Some pathfinder project teams have been able to provide additional data, which suggests that other sources may exist but need to be identified.

The fact that some relevant data is not easily accessible to those working on flood resilience at the community level, or may not exist at all, is likely to be associated with questions of governance, such as how community level flood resilience is embedded within local authority and emergency response structures. This is explored further in Section 11: Building Community Capacity for Flood Risk – Institutional Resilience.

Range in data collection and analysis across pathfinder project teams

Monitoring and evaluation experience, skills, techniques, approaches, attitudes towards the process, and the personnel undertaking related activities varied widely across the 13 pathfinder project teams.

For some members of the project teams this was their first time conducting evaluation research and collecting data alongside project delivery. To overcome any lack of evaluation skills and capacity, as well as to ensure an independent view, six pathfinder projects utilised project partners or contracted external evaluators to conduct their project-level evaluations: Calderdale, Liverpool, Northampton, Rochdale, Swindon, and Warwickshire. The potential impact on the data of this range in skills and understanding should be acknowledged, for example, mode effect.

It was important to maintain an appropriate balance between the observation / data collection role and the support / facilitation / learning role. Having a team of evaluation coordinators (independent of the pathfinder project teams) supporting the design and implementation of the project-level evaluation plans and a separate pool of experts to review and assess the findings of the scheme-level evaluation helped ensured a level of objectivity.

Household level survey data comparability

The ability to compare between the baseline survey and follow-up survey in Year 2 is limited by the fact that pathfinder projects' sample sizes vary a great deal (see Table 4.2), as do the questions asked (see Annex 7 for rate of response to individual questions), and methods used (see Table 4.1), and that some projects limited respondents in Year 2 to those that had completed the baseline survey. All of this means that a direct comparison between baseline and Year 2 results is not meaningful and analysis should be treated as indicative at best.

Table 4.2. Lowest and highest number of responses by Pathfinder across all questions in the household survey at the baseline and Year 2[17]

Pathfinder / Data collection stage		Number of responses	
		Lowest	Highest
Blackburn with Darwen	Baseline	85	103
	Year 2	2	1621
Chesham	Baseline	3	163
	Year 2	2	57
Calderdale	Baseline	19	180
	Year 2	38	139
Cornwall	Baseline	55	235
	Year 2	53	181
Devon	Baseline	45	117
	Year 2	118	150
Liverpool	Baseline	41	81

[17] These figures are taken from across all the questions in the household questionnaire for all the pathfinders. They show the lowest number of responses to any question and the highest number of responses to any question

Pathfinder / Data collection stage		Number of responses	
		Lowest	Highest
	Year 2	48	52
Northamptonshire	Baseline	1	149
	Year 2	43	87
Rochdale	Baseline	6	48
	Year 2	5	17
Slough	Baseline	3	417
	Year 2	4	170
Southampton	Baseline	3	8
	Year 2	4	7
Swindon	Baseline	37	98
	Year 2	15	38
Warwickshire	Baseline	12	333
	Year 2	20	38
West Sussex	Baseline	14	236
	Year 2	25	355

Implications for the evaluation

Triangulation of survey data with qualitative data sources has helped to address the limitations, and commentary on quantitative findings is provided where possible at the scheme-level or related to specific projects, including how pathfinder project teams have used the evaluation data themselves. It is important to acknowledge that the methodology employed for the evaluation of the scheme was experimental by design. It provides examples for how data *could* be used and important lessons for future research.

5. Pathfinders' Aims and Objectives: What Did the Pathfinders Aim to Do?

Aims and objectives

Defra set out three objectives for the pathfinder scheme:

1. Enhance flood risk management and preparedness in ways which quantifiably improve the community's overall resilience.

2. Demonstrably improve the community's financial resilience in relation to flooding.

3. Deliver sustained improvements which have the potential to be applied in other areas.

Each pathfinder project developed its own ways of achieving these objectives and its own set of project objectives. As a result, the objectives are written in different styles, with some pathfinder projects identifying a single general objective and spelling out the detail in the project activities while others have included objectives for each of their work strands.

In this section we review the pathfinder projects' stated aims and objectives, as set out in their Year 2 Evaluation Reports, in order to understand the outcomes they were seeking to achieve. Two points should be noted about this analysis:

- There was a change in terminology between the original Project Plan, where the template asked applicants to give the 'purpose' of the project, and the final Evaluation Report where pathfinders are asked to list their 'objectives'. In several cases, these two things are described in slightly different ways. It is not clear whether this reflects shifts in emphasis in terms of objectives within each pathfinder team or different understandings based on whether 'purpose' or 'objectives' are asked for.

- Where pathfinder projects have only provided a high-level description of the project purpose or objectives, it has not been possible to take account of specific objectives in this analysis. This section does not look at the pathfinders' activities or work packages (this is covered in section 6).

Focus of the projects in relation to resilience categories

Table 5.1 provides an overview of the focus of the pathfinders, in terms of the five resilience capacities.

Table 5.1: Overview of the focus of the pathfinders - resilience capacities

Pathfinder	Distribution of objectives by resilience capacities				
	Social	Economic	Community capital	Institutional	Infrastruct-ure
Blackburn with Darwen		✓	✓	✓	
Calderdale		✓	✓	✓	
Chesham		✓	✓	✓	✓
Cornwall			✓	✓	
Devon			✓	✓	✓
Liverpool	✓	✓			
Northamptonshire		✓		✓	
Rochdale			✓	✓	
Slough	✓		✓	✓	
Southampton			✓	✓	✓
Swindon			✓	✓	
Warwickshire				✓	✓
West Sussex		✓	✓	✓	

- Only two of the 13 pathfinders explicitly set out to build social resilience.
- Six pathfinders' initial projects aimed to improve economic resilience.
- Ten pathfinders included community capital as one of their objectives.
- All the pathfinders except Liverpool aimed to develop their institutional resilience capacities.
- Four pathfinders had defined infrastructure resilience goals at the start of the project.

In practice, most of the pathfinders carried out activities relevant to more of the resilience capacities than they had originally set out to cover. Comparing this table to the table of activities in section 6, it appears that all of the pathfinders carried out activities designed to strengthen community capital, institutional and infrastructure and many more included social and economic resilience activities than had planned to.

Reflecting local contexts in objectives

In a few cases, the pathfinder projects' objectives are explicitly shaped by the local flood context. Both Cornwall and West Sussex aimed to build on learning from flooding and the flood recovery process in 2010. The Devon pathfinder explicitly focused on Rapid Response Catchments, which are common in the South West and '*where minimal or no advance warning is given for flooding'*.

Changes in objectives

Two pathfinder projects (Swindon and West Sussex) reported that their objectives had changed in the course of the project, although in Swindon's case this was very early on. The Swindon pathfinder re-drafted its objectives whereas West Sussex made changes to specific objectives, for example to the objective of achieving a reduction in insurance premiums through increasing confidence in damage reduction outcomes in the pathfinder areas.

6. Inputs, Activities and Links to Resilience: What Did Pathfinders Do?

Introduction

This section describes the inputs and activities of the pathfinder scheme and draws on specific examples from the 13 pathfinder projects. Inputs to the pathfinder projects are categorised as being human resource inputs, financial inputs or additional inputs (e.g. help in-kind and volunteering). Activities are also explored and categorised depending on which of the five resilience categories they are considered to predominantly support.

Data sources used in this section include the pathfinder projects' Year 1 and 2 evaluation interviews, Year 1 and 2 Evaluation Reports and Final Reports.

Inputs

Human resource inputs

The pathfinder scheme has run for two years, which is a relatively short period of time to engage with communities, deliver interventions and develop long-term sustainable projects.

The 13 pathfinder projects provided data on the human resources (project managers, partners etc.) contributing to the project and the time that they have inputted (see Annex 6).

Pathfinders received help in-kind from a range of partners, such as the Environment Agency, County Resilience Groups, water companies (e.g. Hydrologic, Anglian Water and Severn Trent Water), fire services and Council departments. Nine pathfinders partnered with the National Flood Forum (NFF) and had a member of NFF staff working in their Council offices on the community engagement aspects of the project: Chesham, Liverpool, Rochdale, Slough, Southampton, Swindon, Warwickshire and West Sussex. Pathfinders also used university students to support their interventions: Warwickshire had a full time student intern to support community engagement and Cornwall used MSc students to collect data, analyse business options for their flood forum and produce reports.

Pathfinders have used external contractors to support delivery as well as monitoring and evaluation of pathfinder interventions, such as CAG Consultants, Warwickshire Wildlife Trust, JBA Consultants, Groundwork, University of the West of England, University of Manchester, RAB Consultants Limited, MEL Research, Newground, Mary Dhonau Associates.

The biggest issue with human resource inputs was related to the project manager role. Three pathfinder projects experienced delays to the project manager starting (Calderdale,

Chesham and Cornwall), five pathfinders reported that their project manager left or was replaced internally during the first year (Chesham, Devon, Northamptonshire, Slough and West Sussex) with another reporting that their project manager was absent for a period of time due to illness (Swindon). The changes in project manager may also reflect the additional pressures on staff working on short-term projects.

Another human resources difficulty reported were issues related to community flood resilience officers. One pathfinder project experienced difficulties with recruitment that resulted in a delayed start of the required activities (Swindon). Whereas for the Slough pathfinder a challenging first year in terms of progress was attributed to the fact that their community officer only held a part-time position.

The Liverpool pathfinder saw its large internal team reduced and reorganised in Year 2 with a decrease in capacity and in staff levels leading to lower levels of community engagement in Year 2. The Calderdale pathfinder found that new staff members in other council departments caused delays to their pathfinder work as new staff needed to be trained before being able to support interventions. In West Sussex the project manager role was taken on by the community resilience manager, after the project manager role had been vacant for five months until March 2014.

Financial inputs

Table 6.1 shows the Defra grant allocated to each of the projects, and the funding raised from sources other than Defra. A few projects were able to obtain funding to provide their own grants to community flood groups. The largest of these was in West Sussex, where the pathfinder managed to obtain approximately £2.3 million through West Sussex County Council's Operation Watershed – Active Communities Funding part of which is being used to support flood groups.

Table 6.1: Pathfinder projects' grant allocation and amount of funding from additional sources

Pathfinder	Grant allocation	Funding from additional sources
Blackburn with Darwen	£246,047	£379,375
Calderdale	£310,000	£37,250
Chesham	£300,000	£62,605
Cornwall	£238,000	£25,000 (minimum)
Devon	£488,400	£84,107
Liverpool	£306,600	£14,000
Northamptonshire	£299,150	£25,000
Rochdale	£248,000	£29,000
Slough	£284,665	Not indicated

Pathfinder	Grant allocation	Funding from additional sources
Southampton	£472,000	Not indicated
Swindon	£278,310	None
Warwickshire	£251,300	£67,330
West Sussex	£298,500	£2,298,000

Additional inputs

Eight pathfinder projects (Blackburn with Darwen, Chesham, Cornwall, Devon, Liverpool, Rochdale, Swindon and Warwickshire) reported receiving staff time in-kind from their project partners: Councils, Highways Agencies, Fire and Rescue Service, and other project partner organisations such as the Environment Agency, United Utilities and South West Water.

In addition to providing staff time as a form of help in-kind, local authorities and project partner organisations also provided other inputs to support the pathfinder projects. Local authorities, libraries and supermarkets (Sainsbury's and Waitrose in Chesham) have all provided free space for pathfinder events. Local authorities and partner organisations have also provided meeting rooms and in some cases refreshments.

Universities and private companies have also provided support across the pathfinder scheme. In Cornwall, South West Water installed a telemetered rain gauge without charge, Cormac donated the use of road signs (and sandbags to secure them) and Cory Environmental donated 1,200 black plastic sacks for leaf litter collection. Manchester Metropolitan University provided free educational materials to support the Liverpool pathfinder's engagement with youth groups and schools. In the Rochdale pathfinder, the local authority, Environment Agency and United Utilities provided substantial in-kind support wherever possible in the form of the provision of rooms and leaflets, and printing services. The Environment Agency also provided substantial in-kind support to the Swindon and Devon pathfinders.

Volunteers, voluntary organisations and schools have also made significant contributions to the pathfinder projects with local residents volunteering their time to attend flood groups and to sit on project boards, to run flood warden training etc. and teachers with children taking part in sessions on flooding.

Activities

Work packages have been used as a proxy for specific activities, and across the 13 pathfinder projects work packages have been classified by the five resilience categories used in this evaluation: social resilience, community capacity, economic resilience, institutional resilience, infrastructure resilience. The categorisation of work package is

based on a judgement about which category of resilience the work package is predominantly seeking to strengthen.

Table 6.2 highlights the number of work packages related to each resilience area, with the intention of illustrating which areas of resilience had been the main focus of activity among pathfinders.

Table 6.2. Pathfinder work package numbers by resilience category

Pathfinder	Social	Community capital	Economic	Institutional	Infrastruct-ure	Total
Blackburn with Darwen	1	5	1	3	3	**13**
Chesham	1	1	1	4	3	**10**
Calderdale	0	3	4	3	3	**13**
Cornwall	0	2	2	3	3	**10**
Devon	2	2	0	1	1	**6**
Liverpool	2	3	1	2	3	**11**
Northants	0	2	2	3	2	**9**
Rochdale	1	4	1	3	2	**11**
Slough	3	3	2	2	3	**13**
Southampton	0	5	1	1	2	**9**
Swindon	1	4	0	1	1	**7**
Warwickshire	0	1	1	1	1	**4**
West Sussex	1	3	3	2	3	**12**
Total	**12**	**38**	**19**	**29**	**30**	

Table 6.2 shows that the area of resilience with the most work packages (38) was building community capital. Institutional (29 work packages) and Infrastructure resilience (30 work packages) were also the focus of much activity. The area of resilience with the lowest number of work packages was social resilience.

It is important to note that there were overlaps between the categories, and activity in one area may have supported outcomes in another (e.g. work to improve infrastructure may have raised community awareness of flood risk and increased community capital), and that some work packages could be classified under multiple resilience categories depending on the context in which they were undertaken. Engagement with schools and pupils could have led to individual households increasing their social resilience or to increasing institutional resilience as if it was targeted at the school as an institution. As an example, a work package to install a rain gauge in a school was classified as related to community capital: pupils and staff at the school were given access to the rain gauge, and through this

will have acquired improved knowledge and awareness of flooding. However, the aim of this activity was for households to become connected and engaged through their children's flood related activities at school leading to an increase in community capital, and this work package was classified as such.

See sections 7 to 11 for further description and analysis of pathfinder project activities related to each of the five categories of community resilience.

Table 6.3: Examples of pathfinder activities grouped by resilience category (broadly categorised)

Social	Community Capital	Economic	Institutional	Infrastructure
• Targeting residents in areas of multiple deprivation	• Social media • e-learning packages • educational DVDs	• Work with insurers to reduce premiums • Consultation with insurers	• Flood Champions • Flood watch activities (including training) • Flood warden training courses	• Property-level protection / surveying
• Mapping and identifying need	• Film festivals • Public engagement events	• Engaging with businesses	• Flood groups • Flood forum • Annual peer workshops	• Surface water management measures • Leaf litter projects
• Information in different languages	• Community learning events	• Flood plans for businesses	• Community flood plans • Community 'toolkit' • Flood store	• River stewardship / upland land management
	• Preparing for a 'community flood bus' tour	• Researching / obtaining additional project funding	• Commissioning work for MSc students to complete	• Flood action trigger & warning systems (rainfall gauges, sirens)
	• Baseline surveying through door knocking / drop-in sessions		• Engagement with schools and pupils / land owners / local scout, cub and beaver groups	• Survey highway drainage into culverts • Drain network surveys
	• Distributing flood packs / grab boxes to properties or businesses		• Developing relationships with existing community groups and companies • Volunteer recruitment	• Installation of rainfall and river level telemetry systems

Note: The table is originally from the Baseline Characterisation Report (2014) and drew on the pathfinders' Project Plans. It has been updated to include additional activities that have appeared in the pathfinders' Year 1 and 2 Project Reports in italics.

Flooding incidents 2013-2015

While there had been many flood events in 2012, the pathfinder projects coincided with a period of relatively low incidence of surface water flooding. The 2013/2014 winter floods were generally caused by storms and heavy rain. They affected most pathfinders either directly or indirectly. Increased workloads for local authority staff and partnership organisations responsible for flooding resulted in decreased capacity to work on pathfinder project delivery. For example, many project officers were actively engaged in emergency response and recovery work. The UK Government's subsequent announcement of the 'Repair and Renew' Grant placed an additional time pressure on some pathfinder project staff but also provided opportunities to promote messages and join up work.

Only a few pathfinder project areas experienced flooding incidents in 2014/2015. For example, only one significant flood event occurred in the Chesham pathfinder area, while the Northamptonshire pathfinder area saw a total of nine flood investigations which was a significant reduction in comparison to the 251 reports received in the previous year. Such instances of flooding in 2014/2015 were primarily as a result of surface water or agricultural runoff.

7. Community Engagement

Key findings

- Pathfinder projects started with different levels of existing community engagement knowledge and ability and have taken a variety of approaches:
    - Nine pathfinder projects contracted the NFF to lead on community engagement (Chesham, Liverpool, Rochdale, Slough, Southampton, Swindon, Warwickshire and West Sussex).
    - Four local authorities led community engagement (Blackburn with Darwen, Cornwall, Devon, Northamptonshire).
- A community-led or combined (community and institution-led) approach was found to be the most effective approach to community engagement and may lead to flood resilience in the long term.
- The main catalysts for community participation (e.g. in flood groups) are:
    - A community's experience and response to a flood event (which may be facilitated by a trusted intermediary organisation such as the NFF).
    - Key people – these can be activists within communities as well as community engagement officers from local authorities, the NFF, or other stakeholder organisations.
    - Funding opportunities – the scheme has provided funding opportunities for local authorities, community groups and partner organisations that have generated actions and interventions.

Community engagement is at the heart of the pathfinder scheme; the pathfinder projects' activities, outputs and outcomes; and to building all five categories of community resilience, particularly community capital (see section 9 for further discussion on community capital). This section reviews this area of work and highlights the different approaches and valuable lessons for pathfinder projects' community engagement activities.

The main focus of the pathfinder projects has been on involving members of the community and local organisations in preparing for and responding to flooding. The term 'community engagement' is used to describe the process of initiating and maintaining direct contact with members of the community and community organisations for this purpose.

Community engagement context and delivery

Starting point for community engagement

Before starting community engagement, it was important for all pathfinder projects to understand the social factors (e.g. social, economic and place inequalities), starting point and capacities (strengths and weaknesses) that already exist within each community (e.g. existing social networks and links between citizens, interventions, resources and flooding experience). This would help determine where each community was on the resilience 'continuum', the extent to which community members were able to act and build resilience, the appropriate engagement approaches and interventions, and the intended outcomes and impacts. This is an essential point both in relation to disaster planning as this affects communities' ability to respond and to cope with flood risk. As shown by the pathfinder project sketches in section 2, context, characteristics, social and place inequalities, and therefore resilience capacities, differed in each pathfinder community. It should not be assumed that all communities are equally equipped to act, that any costs and benefits of pathfinder project interventions will be evenly distributed and that they will have addressed social inequity.

Target populations

Southampton is the only pathfinder project that defined its target population down to the house level (39 properties were covered). The other pathfinder projects sought to engage more broadly with residents (and in some cases businesses and other users) within the target area. All of the pathfinder projects aimed to work with communities at risk of flooding as well as those that have been flooded.

Community engagement delivery

From the start, there were differences between the pathfinder projects' approaches to engagement with communities. Nine projects contracted the NFF to lead on community engagement (Chesham, Liverpool, Rochdale, Southampton, Swindon, Warwickshire and West Sussex). Slough began by using Slough Borough Council's contractors to engage community organisations and residents but asked the NFF for support in Year 1 and then the NFF provided a fulltime community engagement officer in Year 2. Supporting statements from interviewees include:

> *'The NFF have been instrumental throughout, even before the project started, they provided support in submitting the bid, and their support hasn't waned throughout.' (Interviewee 11PM)*

> *'Mainstreaming the approach to recovery using the good practice and experience of the National Flood Forum [has been a key to the success of the project].' (Interviewee 13SH1)*

The local authority led the delivery of community engagement activities in four of the pathfinder projects (Blackburn with Darwen, Cornwall, Devon and Northamptonshire). Northamptonshire County Council was supported by Mary Dhonau Associates, an independent contractor.

Approaches to community engagement developed

Capitalising on existing community capital: identifying key active community members and organisations

Some pathfinder projects prioritised contacts with existing community groups, such as residents' and neighbourhood associations (e.g. Liverpool), Parish Councils (e.g. Northamptonshire) and ward solution meetings (e.g. Blackburn with Darwen), 'piggybacking' on community events organised by other community and faith groups (e.g. Swindon held a stall at a dragon boat racing event, West Sussex engaged with the Diocese of Chichester and Rochdale with local mosques), joining other funding initiatives (e.g. the Repair and Renew grant). Further examples include:

- Warwickshire: built on the success of previous work to engage and support communities in 12 parishes carried out by Rugby Borough Council. The output from this project was an emergency flood booklet and increased flood awareness. Two of these parishes were selected for inclusion in the pathfinder project. Rugby Borough Council is working with the other seven parishes under the banner 'Pathfinder Plus', to help them run similar activities to those in the pathfinder, but without monitoring and evaluation.

- West Sussex: as a legacy of severe flooding in 2012, West Sussex built on resources provided by Operation Watershed's Active Communities funding and the recovery work of the Environment Agency and the NFF. West Sussex felt that they were able to get ahead with the work because a lot of capacity building was carried out by the NFF in 2012 with flooded communities.

Working through existing community groups or taking advantage of existing initiatives offers potential for replication and enhancement of flood risk management in other areas and preparedness in ways which improve the communities' overall resilience.

Identification and recruitment of key people who could provide leadership to more effectively develop a new flood group was found to be a useful approach for pathfinder projects such as Chesham and Devon (e.g. for the Aveton Gifford flood group). This often involved prioritising meetings with active community organisations and people who could bring their skills and networks to the nascent flood groups.

Taking a wider view of resilience and framing initiatives beyond flooding

A number of pathfinder project managers reported that embedding flooding initiatives into wider, social issues (for example, housing, poverty, litter, dog waste, etc.) and dialogue, rather than addressing flooding in isolation, can help communities to see the relevance, particularly in areas that have not recently flooded. Local knowledge can be particularly useful in identifying the most appropriate approach to engagement and framing the initiative in a way that resonates with members of the community and encourages more participation.

These project managers stated:

> *'Social issues have come up a lot – now looking at community plans rather than flood plans. You have to have a conversation and direct people to those that can help deal with other issues first and then they're ready to have conversation about flooding.' (Interviewee 3PM)*

> *'You cannot take flooding as the only issue when engaging communities as it is more complex than that. General household maintenance and energy efficiency are also issues. It provides opportunities to link a number of resilience issues together such as economic and social. Working with social and private landlords becomes a wider conversation involving resilience…. A wider issues perspective is required to keep it relevant to the communities and link to other issues, such as power cuts and traffic problems.'* (Interviewee 8PM)

One project manager felt that this approach was '*more likely to lead to long term legacy and sustained resilience'* (6PM). The framing may vary depending on the socio-economic characteristics of the community and assessment of a community's starting point is essential at project commencement. Some pathfinders may have focused on vulnerability at the start as they had been dealing with these communities on other issues already. A link can be made here to institutional and community capital as networks, interaction and multi-agency meetings with other partners have enabled pathfinders and flood groups to put flooding onto other agendas.

Furthermore, interventions that are framed with the aim to cultivate a variety of skills as well as an understanding and ownership of responses to flood risk management can be more appealing than a specific flooding focus. For example, the Liverpool pathfinder project's community engagement work to target residents in an area of multiple deprivation has been combined with Liverpool City Council's Healthy Homes and Fuel Poverty programmes. The project has enabled local residents to work on initiatives with multiple objectives, going beyond increasing physical resistance to flooding to encompass measures that increase the physical attractiveness of the area and the well-being of its residents, such as the planting of trees in collaboration with Mersey Forest. There is great potential offered by these activities to enhance flood risk management and preparedness in ways which improve multiple categories of resilience capacities, and to deliver sustained improvements which have the potential to be applied in other areas.

Combining community-led and institution-led approaches

Interventions that are led by a community's needs, concerns and priorities, and therefore, that take a community-led or combined (community *and* institution-led) approach were found to be the most effective.

> *'Although it is bottom-up in one sense, the original initiative came from [the local authority], and the nature of the project because we thought it would be a good idea to form a group. It caught their imagination…. The model of the grassroots approach definitely works as the communities feel they have a voice, as feel they can then talk in non-contentious way.'* (Interviewee 12PM)

One of the key successes was that the activity to develop flood action groups and subsequently work with them led to constructive, collaborative meetings with multiple agencies to tackle flood risk on a partnership basis. Without this engagement the proactive, collaborative approach could not have taken place. Holding multi-agency meetings was often a core part of the community engagement process. The multi-agency approach helped to develop social and institutional networks within communities and from local to national level, and to increase community empowerment and ownership of interventions, such as flood plans and flood groups. As this stakeholder interviewee stated:

> *'The multi-agency approach to the engagement was much more effective than previous single agency campaigns leading to a much better understanding of the flood risk in the area and the possible ways of dealing with this risk to the issues. One of the outcomes of this was the development of community resilience hubs to educate and empower communities to improve their resilience.'* (Interviewee 8SH1)

Commonly, pathfinder project officers would organise the first multi-agency meetings, then support flood groups to run the meetings themselves before finally withdrawing. In some cases, pathfinder projects viewed the setting up of a multi-agency meeting by a flood group as a project milestone or end point in itself and the resultant outcomes and sustainability are not yet apparent. The term 'multi-agency meeting' has proved popular across the pathfinder projects and has been championed by the NFF in those pathfinders where they are partners. However, it has not been defined and it is unclear whether the terms of reference differ, for example, if meetings must have a prerequisite number of attendees, range of institutions and community members represented, etc. This could be something to develop in the future.

Building a community's trust and receptiveness

Becoming a familiar presence in a community and building trust has helped pathfinder project teams to build trust and to encourage community members to get involved with interventions, such as to participate in a flood group or multi-agency meeting, or to attend community events. Adoption of a multi-layered approach has also helped to increase opportunities to develop familiarity, trust and community resilience. Widespread dissemination of resources developed by pathfinder projects, with multiple conversations

with potential group members and multiple access points to sources of information in pathfinder communities has proved a successful engagement approach.

Pathfinder projects have shown that communities are more receptive to representatives of voluntary and community organisations (VCO) than staff from local authorities, as these interviewees attest:

> *'Our flood forum is seen as independent / an honest broker and this has made a big difference. There is a healthy distrust of authorities partly due to the lack of funding for authorities for perceived jobs e.g. drain clearing.' (Interviewee 4PM)*

> *'Having someone who's not from the county council go in there and engage with the community has been very helpful as there can be a lot of baggage with the council'* (Interviewee 12PM)

This indicates that the trust and understanding of the local community are key factors for increased receptiveness. There is a key role for individuals and intermediary bodies who facilitate links between the informal structures of local communities and the formal structures of local and national government as well as linking local actions to wider networks. These may be NGOs (e.g. the NFF), networks of organisations (e.g. West Sussex's Peer Learning Network) or individuals (e.g. Flood Champions).

Challenges for community engagement

The pathfinder projects started with different levels of existing community engagement knowledge and ability and have taken a variety of approaches. A number of challenges and learning points have been identified specific to community engagement from the Final Project and Year 2 Evaluation Reports and evaluation interview data.

The process of community engagement was a challenge commonly identified by many of the pathfinder project managers in their project reports and evaluation interviews. Difficulties cited were primarily related to motivating communities to get involved. For example, low attendance at events and meetings, low responses to letters to arrange PLP surveys, etc.

Competing priorities and lack of time available

For community engagement to be effective, it is important to recognise that community volunteers' time is not unlimited; volunteering is not free, indeed it requires a great deal of financial and human investment; communities are transient and changing; inherent differences exist in communities' levels of capacity.

Perceived lack of relevance or priority for communities as an effect of disparate and transient populations and different types of tenure

For example, Darwen has a transient population and high proportion of rental accommodation, therefore, the Blackburn with Darwen pathfinder found that people had little motivation to improve rental properties and landlords were hard to trace. There were clear differences in the responses of these groups and that of communities in Blackburn where more people have lived in the community for a long time and may be owner-occupiers. In Devon and Cornwall, having a significant proportion of second homes was seen as a challenge for improving community resilience. A small number of people who live permanently in the community have to take on more responsibility for resilience measures and, for example, community issues that are not the responsibility of individual property-owners, such as an increase in the risk of flooding from blocked gulleys, can be disowned by people who are absent for much of the year.

Socio-economic problems

This was mentioned by four pathfinder projects as a reason for why some community members found it harder to become involved in a flood group than others: '*People are hard to engage with largely because they have much more immediate problems to worry about'* (Interviewee 9PM). For example, in Bedworth, Warwickshire, the pathfinder project team found that more affluent groups were willing to engage but there was no interest from those living in social housing.

Concern of property owners about effects on property prices and insurance premiums

Several pathfinders said that property owners might prefer not to recognise that their home was at risk of flooding, believing that this might result in their property value going down or their insurance premiums going up. One pathfinder project manager stated, '*even some that have flooded don't want this recorded and prefer to do the repairs themselves'* (Interviewee 4PM).

Some pathfinder projects also recognised their learning about the practical implications, such as timing and location of events. Specifically, it was vital that events were at times when the relevant people were available to participate and to go to places that were familiar to those people e.g. local halls.

Learning points

The skill of community engagement

A key learning point for many pathfinder projects has been to understand the importance of dedicated, skilled and experienced community engagement officers. The involvement of the NFF was appreciated by a number of project managers.

'NFF have really helped and have come into their own in YR2. YR1 was focussed on community engagement more widely and YR2 focussed on the setting up of the flood action group and getting them to do their community flood plan. Their expertise has been invaluable, not sure that they (the LA) would have been able to do it because they don't have the expertise and also the NFF are independent. So really glad that they have had the benefit of the NFF and it has really come out in YR2.' (Interviewee, 10PM)

A flexible approach

Pathfinder projects have needed to change some of their activities as a result of their community engagement work and to recognise that a 'one-size-fits-all' approach is not effective. Examples include:

- Devon: decided not to use flood visualisation as a means of engagement because they found it was easier and more effective to talk to people instead of showing them a model. They acknowledged that it was not possible to engage with equal intensity with all 24 communities and that it is harder to engage larger communities where there has only been a small proportion of flooding. Therefore, they focussed on those who have been affected by flooding.

- Blackburn with Darwen: experienced low turnouts at community meetings on flooding in Year 1. The team changed its approach in Year 2 and found greater success in attending existing neighbourhood association or ward solution meetings or speaking one-to-one with individuals at flood risk.

- Slough: found initial engagement with schools activities went well but it did not reach the local community as they had hoped because the school had a wide catchment area. The pathfinder then changed their approach to go through existing community groups instead.

Clear communication and celebration of contributions

Good communication and relationships with project partners and community groups are essential for development of community or shared ownership and empowerment and are essential to developing community capital. Miscommunication between project partners and a community flood action group almost led to difficulties for this pathfinder:

'[They] thought money was being withheld when actually it was contingent with them achieving certain outputs. That was not communicated well. Also it was unclear who had responsibility for the flood store so the placing of it was delayed. The community had taken account of the flood risk to the store through procedures while professionals wanted it out of the risk area. It almost resulted in resignation of whole group.' (Interviewee 2PM)

In consultation with communities, it is important to clearly define roles, responsibilities and communication routes in networks and to establish a clear exit strategy early on in a

project. It is also essential to keep communicating gratitude to community members/volunteers for their contributions, skills and knowledge and to ensure that achievements are consistently celebrated and recognised.

Main catalysts for community engagement as identified by pathfinder projects:

A community's prior experience of flood events

Six pathfinders found it easier to engage communities where people have been flooded than where they have not. The effect of a flood event was often to bring people in a community together and sometimes that will galvanise action and lead to future resilience building, but not always. It was more likely to if it was facilitated by a trusted intermediary organisation, such as the NFF. Evidence from pathfinder project managers interviewed includes:

> *'Momentum comes from the communities being flooded or seeing others flooded' (Interviewee 4PM)*

> *'Where it never actually floods, no one is interested. It's all about focussing on the right areas. They need to have been flooded….'* (Interviewee 9PM)

The Northamptonshire Final Project Report suggests that given the limited resources available for flood resilience measures and the low response from those who have not experienced flooding, communities that have experienced flooding should be prioritised. Interestingly, it was not as clear as perhaps was thought in terms of the experience of flooding leading to action. As illustrated in Box 7.2, the Warwickshire pathfinder project team experienced opposing responses to the 2013 Winter Floods from two communities.

Funding opportunities and initiatives

The pathfinder scheme funding from central government (in conjunction with any additional funding sources) has provided opportunities for local groups and local government that have generated actions and interventions.

Key people and institutions

These can be active community members as well as community engagement officers from local authorities, the NFF, or other stakeholder organisations.

Box 7.2: Warwickshire pathfinder project team case study: the impact of the 2013/14 flood incidents on community engagement

Positive reaction: There was some interest in setting up a flood action group before the Christmas floods in Shipston-on-Stour. However, the heavy rainfall over Christmas nearly resulted in local flooding and led to a large number of requests from residents to set up a flood action group. The first meeting was then held in January and had a strong turn-out of 35 people. They have become one of the most proactive flood action groups in Warwickshire and, having just held their first multi-agency meeting, are looking to engage with businesses on reducing their flood risk. The group hope to gain enough feedback to then approach the Environment Agency and request funding to work in partnership with these businesses to reduce their flood risk.

Negative reaction: The Environment Agency held public flood surgeries in early 2013 and found that there was interest in setting up a flood action group in Polesworth and that this community would benefit from being included in the pathfinder project. However, since then the pathfinder project has encountered low levels of public engagement here with initial drop-in sessions in November 2013 having very little success. This change has been attributed to river dredging being carried out, the relining of drains and the creation of a ditch flood alleviation scheme in Polesworth since the Environment Agency flood surgeries. These attempts to reduce flood risk may have led to members of the community being less interested in engaging with flooding as an urgent issue now.

Key messages

- **Use a combined community-led and institution-led approach.** Interventions led by community priorities may result in more effective flood resilience in the long term.
- **Find out the community's starting point before project commencement:** evaluate the capacities (strengths and weaknesses) and resources within a community to find out where a community is on the resilience continuum and the extent to which community members are able to act and build resilience. Learn from existing initiatives about how to make the most of available resources, potential pitfalls to look out for and solutions.
- **Start activities which develop community participation and networks but have a longer-term vision.** It is essential to learn from local knowledge; listen to the needs, concerns and priorities of a community; and build on local interests to develop interest and engagement. This may not always require a specific focus flood risk.
- **With all community engagement activities it is important to recognise that awareness raising is not an endpoint in itself and to ask the question:** '*What impact will this have on the wider community, preparedness and ability to manage flood risk?*'

8. Building Communities' Capacity for Resilience to Flood Risk: Social Resilience

Key findings

- Eight of the 13 pathfinder projects specifically focused work on building social resilience from the start of the scheme.
- Three pathfinder projects would now place greater emphasis on social resilience if they could start again. This is indicative of the time required to build knowledge and understanding of a community, its needs and existing capacities and suitable engagement approaches.
- As expected, there was no significant change in community resilience indicator data or household survey data between the Baseline and Year 2. Evidence from pathfinder project reports and the evaluation interviews, and outcomes identified from social resilience activities, indicates some change in terms of behaviour and flood risk.
- Across the projects, difficulties were experienced in engaging vulnerable and hard-to-reach groups.
- Pathfinder communities with higher levels of social deprivation have needed more support from the project teams.

What is meant by social resilience?

Social resilience refers to the current and potential capability of individuals to engage with flooding within a community.

Social vulnerability is an inherent component of social resilience. It is a factor of various demographic characteristics that have been shown to exacerbate the social impacts of flooding at the individual level, such as:

- Poor mental and physical health
- Fewer financial resources, financial deprivation and lack of access to support services, e.g. health care
- Lack of social networks and connectivity
- Being a child, youth or elderly person
- Being female

- Low level of education
- Limited English language ability

For example, communities *"with fewer elderly, disabled residents, and non-native speaking residents likely exhibit greater resilience without these characteristics"* (Cutter *et al*., 2010: 8). Therefore, social vulnerability characteristics relevant to flooding were taken into account in developing the common indicators for social resilience. It is important to measure these characteristics specifically and to understand if any of the interventions managed to increase the social resilience of individuals/groups/communities with social vulnerability characteristics.

The relationship between social resilience and social vulnerability

Based on learning from the REA, the evaluation recognises that social vulnerability of communities to flood risk is closely related to social resilience but it is not just the opposite to it: *'A resilient community is not just a community manifesting low levels of vulnerability'* (ENSURE, 2011: 12). It is possible for a person or community to be vulnerable to some shocks and stresses in some ways, yet resilient in others through having capacities to adapt or overcome that vulnerability. For example, a person on a low income who is exposed to flood risk and cannot afford flood insurance could be resilient due to an effective early flood warning system and good emergency service responses that reduce flood damage and associated costs.

The evaluation takes the view of Cutter *et al.* (2008: 599) that vulnerability is a function of the exposure and sensitivity of a system, and that:

> *Vulnerability is the pre-event, inherent characteristics or qualities of social systems that create the potential for harm….Resilience is the ability of a social system to respond and recover from disasters and includes those inherent conditions that allow the system to absorb impacts and cope with an event, as well as post-event, adaptive processes that facilitate the ability of the social system to re-organize, change, and learn in response to a threat* (Cutter *et al*., 2008: 599).

ENSURE (2011: 13) state: 'Sometimes getting back to the exact pre-event conditions is just the opposite of resilience, particularly when high level of vulnerabilities characterized that condition.' This means that some communities may need more support than others to respond to the impacts of flooding and to avoid impacts exacerbating vulnerabilities.

To what extent was building social resilience a goal for pathfinder projects?

Objectives

Despite the original objective of the pathfinder scheme to focus on building community resilience to flooding in socially vulnerable communities, only eight of the 13 projects had a

specific focus on building social resilience in such areas from the start of the scheme (Blackburn with Darwen, Calderdale, Liverpool, Rochdale, Slough, Swindon and Southampton). Liverpool had a clear focus on social resilience across most of its work packages. Swindon was the only pathfinder project to explicitly identify vulnerable people as a target for its work in the original bid. However, Swindon's objectives were changed during the first year and the explicit focus on vulnerable people was dropped. The project manager stated this change was made to avoid stereotyping or 'pigeon-holing' of vulnerable individuals or groups and with the project focused on an area of deprivation it was a given that the project '*would be working with vulnerable people*'. Many pathfinder projects that did not refer to social resilience in their objectives did carry out related activities.

Despite evidence of activities, outputs and outcomes in relation to building social resilience it is unclear why projects tended not to make this an explicit objective from the outset and reasons, beyond those articulated by the Swindon project manager, can only be speculated. For example, perhaps:

- As social resilience covers aspects that are fundamental to getting a project off the ground, projects did not think it necessary to make explicit reference.
- Due to a lack of understanding about the community resilience framework or that flood risk management related to social resilience building might be a useful activity.
- Due to bids not being written by the project delivery teams.

In interviews, some projects reported that building social resilience became an objective later on in the scheme, an indirect benefit of work related to other resilience capacities, or an aspect with hindsight would have been more of a focus, for several pathfinders. This is indicative of the time required to build knowledge and understanding of a community, its needs and existing capacities, and suitable engagement approaches. Now that pathfinders have identified specific issues that need to be addressed, it is important to make this an explicit priority for ongoing community flood resilience schemes.

Table 8.1: Overview of the social resilience indicator data for the 13 pathfinders

Pathfinder	Area of Influence	SR2: Population aged under 65 (%)[18]	SR5: Households with English as their main language (%)[19]	SR6: Households with a person with a long-term problem or disability (%)[20]	SR1: Households in the top 10% of most deprived nationally in terms of education, skills and training (%)*[21]	Focus on social resilience? (No. of work packages (WP))
Blackburn with Darwen	Blackburn with Darwen (district)	87	93	30	31	Yes (1 WP)
Chesham	Chesham (parish)	85	98	23	0**	No
Calderdale	Calderdale (district)	84	98	26	9	Yes (1 WP)
Cornwall	Cornwall (county)	80	99	29	3	No
Devon	Devon (county)	89	97	27	4	Yes
Liverpool	Belle Vale (ward)	82	99	38	27***	Yes (3 WPs)
Northamp-tonshire	Northampton shire (county)	85	96	24	12	No
Rochdale	Rochdale (district)	85	96	30	16	Yes (1 WP)
Slough	Slough (district)	91	85	22	0	Yes (3 WPs)
Southamp-ton	Southampto n (LSOAs)	90	86	25	20****	Yes (1 WP)
Swindon	Swindon East Locality (wards)	85	97	28	14*****	Yes
Warwick-shire	Warwickshir e (county)	82	98	24	8	No
West Sussex	West Sussex (county)	79	98	25	3	No
	Pathfinder average	**85**	**95**	**27**		
	National average (England)	**84**	**96**	**26**	**11**	

[18] Source: 2011 Census: http://www.nomisweb.co.uk/census/2011/ks102ew
[19] Source: 2011 Census: http://www.nomisweb.co.uk/census/2011/ks206ew
[20] Source: 2011 Census: http://www.nomisweb.co.uk/census/2011/ks106ew
[21] Source: 2011 Census: http://www.gov.co.uk/government/publications/english-indices-of-deprivtion-2010

*Note: **data only available at a district level, data for counties has been calculated by including all the districts within them, wards / LSOs / parishes have been included at the smallest scale available ;**data at the Chiltern District scale; **data at the Liverpool District scale; ****data at the City of Southampton scale; *****data at the Swindon District scale.*

When looking at the social resilience indicator data it is important to keep in mind that a straightforward equation of social deprivation and social resilience is not necessarily the case. Percentages of deprived households in four of the eight pathfinder projects with a focus on social resilience are higher than the national average (11 per cent). The Slough pathfinder's focus on social resilience could be explained by the figure of 85 per cent for SR5: Households with English as their main second language, which is below the national (96 per cent) and pathfinder averages (95 per cent). This indicates that there may be lower levels of social resilience and a tangible need that could be identified and addressed by the pathfinder project.

Reasons given by pathfinders interviewed for focusing on social resilience:

- **To reach socially disadvantaged, under-represented, vulnerable groups:**

  '*Social has to be important as it's one of the criteria of the bid, deprivation and how resilient people were or not because of whether or not they were socially-deprived*' (Interviewee 11PM)

- **The focus turned to social resilience as an unintended benefit of community capital activities, (not an intended or explicit focus at the start of the project):**

  '*Groups themselves have looked at this through their plans to identify the vulnerable people but not a main objective*' (Interviewee 5PM)

- **'*It is part of our objectives and ethos*' (Interviewee 4PM) to take a wider view of social resilience, beyond flooding:**

  'Social was always going to be a focus as we picked areas of high deprivation to test out whether it was possible to develop Flood Champions etc. The key was to see if it was possible to set up groups in this context.' (Interviewee 9PM)

On reflection, three pathfinder project managers interviewed stated that given the opportunity to start the project again they would now place greater emphasis on social resilience, and, for example, target '*hard-to-reach urban communities*', the elderly, those living alone, and people with physical and learning disabilities.[22]

Activities

Table 6.2 in section 6 shows that fewer work packages were focused predominantly on enhancing the social resilience category than any other category. Pathfinder projects' work

[22] Pathfinders 4, 6 and 12.

on building social resilience has focused on areas where activities could effect change: improving individuals' and groups' connectivity, ability to access information about flood risk and capacity to deal with flood events. Related activities included:

- Targeting residents in areas of multiple deprivation for community engagement.
- Identifying and engaging vulnerable individuals and groups in the area and involving them in community flood plans.
- Producing and distributing information in the languages of non-English speaking individuals or in different media formats to be accessible for children, youths, elderly or those without an Internet connection.

Without further research, simple explanatory links with the social resilience indicators for the remaining pathfinder communities can only be speculated.

To what extent have pathfinder projects succeeded in building social resilience in their communities?

Social resilience indicators

The indicators for social resilience cover systemic underlying issues that projects were not expected address within a scheme of only two years' in duration with a specific focus on community flood resilience. Therefore, limited evidence is available to understand the extent to which pathfinder projects have succeeded in building social resilience in their communities.

Table 8.2 Indicators for social resilience

Social resilience indicator	Proposed Variable and Rationale	Proposed Indicators	Data Sources
SR1 - Educational equity	*Educational deprivation* increases vulnerability	% of wards with people in the top 10 & and 20% for Education sub-domain IMD	English Indices of Deprivation 2010 – Education, Skills and Training Domain
SR2 - Age	*Older people* may be more vulnerable	% of population under 65	Age Structure - Census
SR3 - Transportation access	*Access to private transport* increases mobility	% with a car	Car availability - Census
SR4 - Communication capacity	*Access to high speed internet* improves access to warning system. A proxy for people talking to each other and accessing information.	% of homes with broadband	Ofcom local authority level data

Social resilience indicator	Proposed Variable and Rationale	Proposed Indicators	Data Sources
SR5 - Language competency	Communities with a higher proportion of the population having English as a second language are more vulnerable	% speaking English as a first language	Household Language - Census

Household survey data

Nine pathfinders provided data on some aspect(s) of social resilience at the Baseline data collection stage. Key points are presented in Table 8.3

Table 8.3 Key points from the baseline on social resilience of pathfinder project areas

Aspect of social resilience	Baseline data
Length of residence	Chesham and Slough have the highest proportion of people who have moved to their current address within the past year.
Age	Of the seven Pathfinders including this question, five had more respondents over 65 years old than in the Pathfinder area population as a whole, possibly reflecting the focus on vulnerable people.
Illness and disability	The extremes for illness and disability are Blackburn with Darwen, where 42 per cent of those responding to the household survey reported having a household member with an illness or disability and Slough where only 14 per cent of respondents were in this situation (compared with a national average of 25.7 per cent in the population as a whole).
Mobility	Big differences between the Pathfinders in terms of ownership of a car or van. The extremes are in Liverpool where 80 per cent of respondents to the household survey did not own a car or van (compared with 53 per cent for the Pathfinder area as a whole), while over 90 per cent in Chesham and West Sussex did own a car or van (compared with just over 82 per cent for the Pathfinder areas).
Communications	Communication methods available in households vary. Mobile phone and Internet use were the most popular methods to access flood information across these Pathfinders while listening to the radio was the least popular method.

As expected there was no significant change in community resilience indicator data or household survey data between the Baseline and Year 2.

Evidence from pathfinder project reports and the evaluation interviews, and outcomes identified from pathfinder social resilience activities, indicates changes in terms of behaviour and flood risk. The scheme overall has led to improved personal knowledge, confidence and skills of vulnerable individuals and groups about flood risk and what they can do when it floods. Social resilience has been strengthened where pathfinder projects have given priority on PLP measures to vulnerable individuals living at highest flood risk.

This has also led to increased infrastructural and economic resilience by implementing PLP measures to reduce internal property damage.

Further, typically, people in areas of social deprivation are less connected to networks (including connection to local authorities), a key aspect of vulnerability. All pathfinder projects have improved connectivity (i.e. made connections between people that have not been connected before) and enabled community voices to be heard and involved in decision-making processes. This has been achieved through targeting and mapping vulnerable people, producing and distributing materials in different languages and media to increase accessibility, developing community flood plans which identify vulnerable people and state how community members will help during an emergency. However, it is unlikely that pathfinder activities have addressed underlying, systemic social vulnerabilities, but this was not an expected outcome. At this stage, the outcomes of the materials developed are unknown as have yet to be tested by communities involved experiencing a flood event.

Both resilience and vulnerability need to be understood in order to be able to develop community capacities for reactive and proactive responses to flood risk. There is no reason why a resilience approach should not focus on vulnerable groups but it must be recognised that working to build one of the five categories of community resilience is unlikely to address an individual's or group's vulnerabilities. Building community resilience to flooding will draw on as well as develop capacities of individuals and communities. To underplay or ignore social inequalities and power relations between actors within the flood risk system would be to provide an incomplete analysis of the issues and any solutions developed to address those issues. To avoid social vulnerabilities being reproduced, it is important to use frameworks that enable assessment of the capacities and vulnerabilities of a community at the start of an intervention to develop sustainable flood resilience. For example, as outlined in section 3, *Cutter et al.* (2010) provide a useful framework for thinking about the specific types of skills and capacities that might be needed to address the impacts of flooding.

Qualitative data

Examples of outputs and outcomes from across the pathfinder projects drawn from the Final Project Reports, Year 1 and Year 2 Project Evaluation Reports and the evaluation interviews, presented in Table 8.4 and the case studies written by the Slough and Swindon pathfinder project managers (see Boxes 8.1 and 8.2) provide evidence of some level of success in building social resilience.

Table 8.4 Social resilience: activities, outputs and outcomes

Social resilience activities	Outputs (examples from pathfinder projects)	Intended outcomes	No. of pathfinder projects carrying out activity
Targeting residents in areas of multiple deprivation for community engagement and interventions	• **Liverpool:** Healthy Homes/Fuel Poverty ('fit and forget' installations), information provided and discussed with householders on how to protect family and property and the importance of looking after the vulnerable during or prior to a flood. • **Slough:** submitting grant applications and installing improvement measures in deprived areas. • **Swindon:** junior flood champions drawn from deprived areas. • **West Sussex:** at least 50 per cent of properties receiving PLP measures were in the areas of highest deprivation. 503 properties targeted for engagement in Bersted, Felpham and Littlehampton. 46 properties have received suitable PLP measures.	• Increased personal knowledge, confidence, skills and understanding of flood risk and what they can do • A side benefit specific to PLP measures can be increased energy efficiency. Additional benefits include: financial savings for households, reduction in fuel poverty, reducing winter deaths, health and social benefits and wider economic benefits. Fuel poverty is a recognised issue to the vulnerable residents on the Woodlands Estate. Link to economic resilience and community capital outcomes. • Social resilience is strengthened as priority on PLP measures given to vulnerable individuals living at highest flood risk. • Increase in infrastructure and economic resilience by implementing PLP measures to reduce internal property damage.	5/13
Identifying and engaging vulnerable individuals and groups in the area and involving them in community flood plans	• **Cornwall:** community flood plans identify vulnerable individuals and a network put in place to offer support • **Devon:** Parish and Town Council records of vulnerable people or properties. In Year 2, 75 per cent have a record of vulnerable people or properties (compared with ten per cent at baseline); surgery in Kingsbridge to identify vulnerable people in the community.	• Identification and process in place through community flood plans. • Improvement in community preparedness and awareness of communities and individuals. • Increased ability of individuals to cope physically and mentally with flood risk.	9/13

Social resilience activities	Outputs (examples from pathfinder projects)	Intended outcomes	No. of pathfinder projects carrying out activity
	• **Warwickshire:** flood plans (by Shipston and Eathorpe flood groups) have identified vulnerable people in the area and what to do in emergencies. • **West Sussex:** community resilience flood plan that identifies vulnerable people and states how community members will help during an emergency.		
Producing information in different languages	• **Chesham:** Chesham's Mayor, Councillor Mohammad Fayyaz was invited to a flood awareness raising event, and helped with language translation. • **Rochdale:** produced literature on sewer flooding risk in Urdu/Bengali. These communications are a resource that is now available to community members and United Utilities. • **Slough:** use of different languages in displays (e.g. a noticeboard in Chalvey was set up both in English and Romanian to provide materials explaining flood risk), visits to residents with fluent speakers, etc.	• Increased flood risk awareness and understanding in pathfinder communities with high percentages of households with English as a second language. • Increased engagement and awareness of flood risk and ability of community members to act effectively during a flood. • Change in behaviours • Increased bonds of trust between communities and formal institutions responsible for flooding.	3/13
Producing information in different media to reach wide range of audiences, e.g. children and young people, and older people.	• **Blackburn with Darwen:** umbrella art, installations and flood-themed film festival organised with People and Planet attended by 800 people to promote pathfinder work amongst the wider community. • **Calderdale:** for the over 65s that may not use computers the eyeoncalderdale site includes a 'Warn your	• Increased engagement and awareness of flood risk and ability of community members to act effectively during a flood. • Change in behaviours. • Increased bonds of trust between communities and formal institutions responsible for flooding.	9/13

Social resilience activities	Outputs (examples from pathfinder projects)	Intended outcomes	No. of pathfinder projects carrying out activity
	Neighbour facility' that provides printable information. Engaged local Scouts groups and ran classes on water and land use with 447 children at Calder High School and five primary schools. • **Chesham:** FloodSmart – A History of Flooding in Chesham has had 520 views on YouTube and was shown to over 400 school children in two schools, FloodSmart Twitter account has 106 followers (25/6/15). Ran two whole-school assemblies. • **Liverpool:** work with Valley Theatre to creatively engage children through developing and performing climate change plays in the area. Video of the flooding play has had 22 views on YouTube (24/6/15). • **Rochdale:** engaged local Scouts groups and developed a badge. • **Slough:** developed materials for engagement with schools. • **Swindon:** established a junior flood action group. Facebook page has 15 likes, Flood Information and Guidance video has had 141 views on YouTube (26/6/15). • **Warwickshire:** developed materials for engagement with schools. • **West Sussex:** supported junior citizen events and initiatives such as Duke of Edinburgh Award and Junior Neighbourhood Watch to reach 10,000 youths.		

Box 8.1 Slough pathfinder project team case study: challenges encountered when working in a multicultural, low income area

The Slough pathfinder project is based in ethnically diverse, low income, flood risk areas. This case study details the challenges of the project, specifically relating to conducting Property Level Product (PLP) surveys and how these were overcome.

It was anticipated that there would be a positive response from residents being offered a free PLP survey. Alongside this, the project was offering free PLP installation, if economically viable. Letters were issued to all 43 properties that were identified as highest priority for the free survey, informing them to call to arrange a survey appointment on one of the available dates. The response rate to this letter was very disappointing, with just three respondents for the first round of surveys and only one for the second round. The poor response rate raised the question of why people were reluctant to be proactive in signing up for this free assistance. Eventually, the majority of properties were surveyed or chose to opt out. Engagement was undertaken through repeated door-knocking visits (at various times of day) to arrange appointments and the approach was changed if initial attempts to contact residents failed. A number of reasons have been considered for the initial low uptake. These, alongside suggestions to mitigate these factors, are summarised in Table 8.5.

Table 8.5: Challenges of arranging PLP surveys in Slough

General Issue	Challenge	Actions/ Recommendations
Language Barrier	• Residents unable to read initial letters. • Residents unable to communicate on doorstep.	• Providing note alongside initial letter stating documents could be translated. Note in variety of languages. • Use of local authority staff with suitable language skills whilst door knocking. • Communicating with younger generations / other members of household better able to speak English. • Making use of neighbourly spirit and using local residents to translate (added advantage that someone trusted was present).
Cultural Challenges	• Challenge engaging with lone female residents within some cultures. • Female residents keen to have surveys but not when husband not present.	• Establish contact with husband by phone or wife arranged with husband on phone whilst we were present. • Ensuring female officer present whilst door knocking.
Priorities and Shift Work	• Residents reluctant to take time off work for surveys. • Residents do not know times they are available in advance. • Residents rarely available during standard hours for engagement.	• We would now encourage survey contractors to include evenings and weekends. • Arranging appointments nearer time of surveys means residents more able to plan around work shifts. • Multiple visits / calls at a variety of times including evenings, to catch residents when they are home.
Property Ownership	• Residents did not feel responsible for council or rental properties.	• Deal with Council Housing department directly to gain access to Council owned properties. • Ensure gain landlord permission for survey.
Financial Implications	• Residents suspicious of our activity / assume	• Reassurances with council identification. • Explanation of existence and scale of previous events.

	trying to sell products, especially when they have not experienced flooding first hand.	• Use of local members to inform.
Other Challenges	• Residents unwilling to work with council directly for fear of consequences e.g. reporting illegally constructed buildings or multiple occupancies.	• Difficult to clarify due to unknown reasons for reluctance. • Unable to include properties that are privately owned and opt out.

Box 8.2 Swindon pathfinder project team case study: Giving a voice – how to empower a community

This case study focuses on the value of community voice. The flood groups were established in the Parks, Walcot and Liden ward of Swindon between October 2013 to March 2015 in areas that have never flooded before and are within the lowest percentage multiple deprivation index in the country. In addition, they have multiple flood risks and have had no previous Environment Agency engagement.

The aim of setting up flood groups was to empower communities to participate in local flood risk management and to give them a voice in decisions that affect their lives. Swindon's National Flood Forum (NFF) project officer made community members aware of the flood group through holding drop-in sessions, talking to people out dog walking, and going to existing community groups to see if people wanted to be part of a flood group. Developing the flood group, listening to members, and supporting them to engage in local flood risk management involved the group working in partnership with flood risk management agencies.

The flood group members were previously unknown to each other and came together 'for a sense of doing something for the community', 'in order to make a difference' (UWE, 2015). In the past, the members had felt disconnected from wider society, and not just in terms of flooding. By being part of a flood group, the members' voices were listened to. The outcomes of the work by the flood group are that awareness levels about flooding have increased, an owner of a flood risk source has been identified, and gulleys are being maintained. Non-flooding related outcomes include increased bridging capital from new friendships ('[People now] say "hi" on the bus.') and one member has been given a new job opportunity as a result of participating in the group.

The chance to have a voice, be listened to, and therefore effectively engage in local flood risk management, would not have happened without the project and the support of the NFF. In order to give them a voice, the pathfinder project team have had to help this flood group more than any other and were intensively involved in getting the group together, establishing them as the representative voice for the area, organising and running their meetings, and dealing with group relations. The group were never forced to do things if they did not want to, but as one member put it 'we want to carry on and have our multi-agency meetings; we just need someone to help us, to lead us.' How sustainable this group will be in the long-term is unknown at this stage, and this will be a challenge going forward. Indeed, the group may not continue past the project's end date because of the need for such intensive help. However, this should not detract from what this group has achieved.

In conclusion, this project understood that all communities deserve a voice, regardless of their flooding history, or social vulnerability characteristics. Being willing to help the group in whatever they need was essential. The pathfinder project team would do this activity again, primarily because of how much being part of a flood group has meant to the individuals involved.

Challenges and learning points: What didn't work?

Across the pathfinder projects, difficulties were experienced in engaging vulnerable and 'hard-to-reach' groups. Early identification of vulnerable community members in any engagement activities will help to build social resilience and to produce clearer, better targeted communications.

One interviewee identified the need to give particular consideration to sustainability and exit planning when developing flood groups in areas of deprivation:

> *'In our formative evaluation we emphasised the importance of ensuring scaffolding for the flood groups once the Project Facilitator withdrew. There were some issues / anxieties already evident from interviews with members. This was particularly the case with the development in the lower socio-economic setting'.* (Interviewee 11PM)

It may be that people in 'lower socio-economic settings' are employed in shift work, away from home, or jobs that do not allow them to have spare time, or it may be that there are disproportionate number of people who are ill or disabled and therefore have limited spare time and energy to participate in community activities. Therefore, it could be speculated that pre-existing levels of social resilience, economic resilience and community capital may be limited in such cases, and thus, the reason for more 'scaffolding' being needed than in a higher socio-economic area.

Key learning points

- **Embedding flooding initiatives into wider social issues (for example, housing, poverty, litter, etc.) and dialogue**, rather than addressing flooding in isolation, can help communities to see the relevance, particularly in areas that have not recently flooded.
- It is important to **identify people and places which face high social vulnerability** to the impacts of flood risk and facilitate partnerships to **carry out actions to support the most vulnerable communities in developing resilience**. Early identification will help to build social resilience, to produce clearer, better targeted communications, and to avoid social vulnerabilities being reproduced.
- **It takes time to build knowledge and understanding of a community**, its needs and existing capacities, and suitable engagement approaches.

9. Building Communities' Capacity for Resilience to Flood Risk: Community Capital

Key findings

- Building community capital was a direct or indirect objective of activities for all 13 pathfinder projects.
- There are significant overlaps between community capital (emphasis on bridging capital) and institutional resilience (linking capital):
    - In most projects effort was spent on building the capacities (knowledge, relationships, confidence) within communities.
    - The projects brought together both dispersed and close-knit communities to limit the impacts of flood risk
- Most projects developed their own social and educational media, often effectively speaking to the characteristics and concerns of local communities.
    - Electronic media (e.g. websites, online videos and social media) appeared to offer a useful way of making information and tools available on demand to wider audiences.
    - Face-to-face learning or networking events are crucial for strengthening bonds between people and providing practical experience of flood risk management.

What is meant by community capital?

Research suggests (Cinderby *et al.*, 2014; Twigger-Ross *et al.*, 2014; Young Foundation, 2012) that community capital is a core capacity for building community resilience and that without it, related actions are not likely to succeed nor pathfinder objectives be met. Community capital is the 'glue' that keeps communities together and provides the foundations upon which community flood resilience can be built. Underpinning community capital in emergencies are networks of bonding, bridging and linking social capital, which may or may not be formed via flood awareness raising or development of flood groups. The underlying mechanism for building community capital capacity is community engagement. Approaches, challenges and lessons from the pathfinder projects' community engagement activities are reviewed in section 6. This section examines the activities, outputs, outcomes, successes and learning points of activities carried out specifically to develop community capital (i.e. networks within communities).

To what extent was building community capital a goal for pathfinder projects?

As shown by Table 6.2, the largest number of pathfinder work packages were considered to predominantly relate to institutional resilience and community capital. Activities designed to raise flood awareness can also be seen as related to the building of community capital. Examples include:

- Social media / e-learning packages / educational DVDs
- Film festivals / public engagement events
- Community learning events / engagement of children and schools
- Community 'flood bus' tour
- Household surveying through door knocking / drop-in sessions
- Distributing flood packs / grab boxes to properties / communities.

All pathfinder projects aimed to implement measures to develop community capital. This was not always a direct objective but was expected to be an indirect benefit of the activities carried out.

Reasons given by pathfinders for focusing on community capital:

- Building community capital is a core project objective. For example:

  '*I suppose that's what we've tried to do, to work with communities at a grassroots level. To form flood groups, to enable them to be able to be more resilient to flooding, to engage more positively with the council.'* (Interviewee 12PM)

- Building community capital is fundamental to the project ethos. For example:

  '… [it is] what the ethos of [our] Flood Forum was about from its outset and therefore we set out to continue to build on those. We didn't think of it in terms of these five elements, just thought about what we needed to do to make communities more resilient.' (Interviewee 4PM)

- To build on existing community capital within a pathfinder project's area of influence. For example:

  'There is a level where people are already members of other groups e.g. WI, this was accepted. Lack of community capital would not stop a plan being written but would affect its delivery and confidence in the plan and its delivery.' (Interviewee 5PM)

It is important to note that views on which resilience capacity is being focused on by a pathfinder project can differ depending on an individual's agenda, motives or role in a project (for example, a project manager or community flood action group member), as described by this interviewee:

> *'[Community capital] is the base of everything. The flood action group might not agree - they might think that more is needed in terms of infrastructure, but we are covering this. What is important is having groups involved and talking to each other.'* (Interviewee 3PM)

To what extent have pathfinder projects succeeded in building community capital in their communities?

The starting point and pre-existing capacities in each pathfinder community will have determined what qualifies as a 'success' and the extent to which change has occurred in each pathfinder project area within the two year scheme. Therefore, the 13 projects will have finished at different points on the resilience continuum.

For example, specific to community capital, knowing local people is an important basis for networks. Three quarters of respondents to all the pathfinder projects' baseline household surveys, except Rochdale, said that they knew many or some people in their neighbourhoods. In Rochdale, almost 50 per cent of respondents stated that they knew 'a few' people.

Participating in organisations and groups and giving time to help out with community activities through institutions or voluntary, charitable or community organisations are ways in which members of communities interact with and support each other. As another example from the baseline, Slough had the highest proportion of respondents indicating that they never go to a group, club or place of worship or help out with public institutions, charities, voluntary or community organisations (VCOs).

Data from the household surveys and indicators have been examined with the caveats that: each pathfinder project area has different specific characteristics; in many cases, two years was not long enough for significant changes to be made in relation to community capital; it is impossible to solely attribute any changes to the scheme; and, the differences in data collection methods and availability.

Community capital indicators

Data were collected on four types of community capital indicators: place attachment (CR1) and political engagement (CR2) to provide background information; social capital – civic involvement (CR3) and mitigation and social connectivity (CR4) to provide measures of change attributable to pathfinder activities.

Table 9.1: Indicators for community capital

Social resilience indicator	Proposed Variable and Rationale	Indicators	Results
CR1 - Place attachment	Migration over short term is associated with reduced sense of belonging	Net migration to area of influence over past 5 years. Second home owners	Accurate data on net migration for the area of influence was only provided by the Cornwall and Devon pathfinders, where net migration to the area for the period 2007-2012 was 20,400 and 23,400, respectively. Three pathfinders provided data on the proportion of second homes in relation to the total number of homes: Chesham, Cornwall and Devon. Buckinghamshire County Council data shows that there are 29 second homes in Chesham out of a total of 9,160 domestic properties, which should indicate that there are high levels of place attachment and of community capital capacity in the area.
CR2 - Political engagement	Political engagement increases community's ability to influence decisions and access resources	% voter participation in 2010 and 2015 elections for each of the parliamentary seats in the 13 pathfinder areas[23]	The average turnout across the parliamentary seats in the pathfinders' areas of influence was 68 per cent in both the 2010 and 2015 elections. Relatively high turnouts were recorded in parts of Warwickshire (Kenilworth and Southam – 81 per cent in 2010 and 74 per cent in 2015), Devon (Central Devon – 76 per cent, 2010; 75 per cent, 2015) and Chesham (Chesham and Amersham – 75 per cent, 2010; 72 per cent, 2015), which may indicate that these pathfinder areas had relatively high levels of pre-existing community capital and were further along the 'resilience continuum'. Relatively low turnouts recorded in Rochdale (Rochdale – 58 per cent, 2010; 57 per cent, 2015) and in parts of Northamptonshire (South Northamptonshire – 58 per cent, 2010; 63 per cent, 2015), Blackburn with Darwen (Rossendale and Darwen – 63 per cent, 2010; 58 per cent, 2015), Liverpool (Garston and Halewood – 60 per cent in 2010; 66 per cent, 2015) and Slough (62 per cent, 2010; 56 per cent, 2015) may indicate lower pre-existing levels of community capital.
CR3 - Social capital – civic involvement	Social capital - organisations increase the networks of relationships and support	Number of community / voluntary / religious orgs in area of influence	Six pathfinders provided data on the number of community/voluntary/religious organisations in their area of influence but it is incomplete, with no comparisons possible between baseline and Year 2 to measure any change attributable to the scheme except for the Liverpool pathfinder. Here, prior to the pathfinder there was an established Residents Association with approximately eight active members and this has been built on to set up a flood group with twelve active members. Therefore, it can be said that community capital has increased in the Liverpool pathfinder project's area of influence through increased civic involvement.
CR4 - Mitigation and social connectivity	Community engagement in flood groups increases ability to respond to flooding	Number of flood groups or community resilience groups in area of influence	No such groups existed in Chesham, Northamptonshire, Slough, Southampton and Swindon pathfinders before the scheme. As a direct impact of the pathfinder scheme, at least one community flood action group now exists in each of the 13 pathfinder areas of influence, resulting in increased community capital in each community.

[23] Based on national average turnout

Household survey data

Graphs in this sub-section represent percentage change between the baseline and Year 2 follow-up data.

Knowing local people is an important basis for networks. In answer to the household survey question: '*How much do you agree or disagree that this area is a close, tight knit community?*' respondents in all but one of the pathfinder projects shown in Figure 9.1 increased their level of agreement on average.

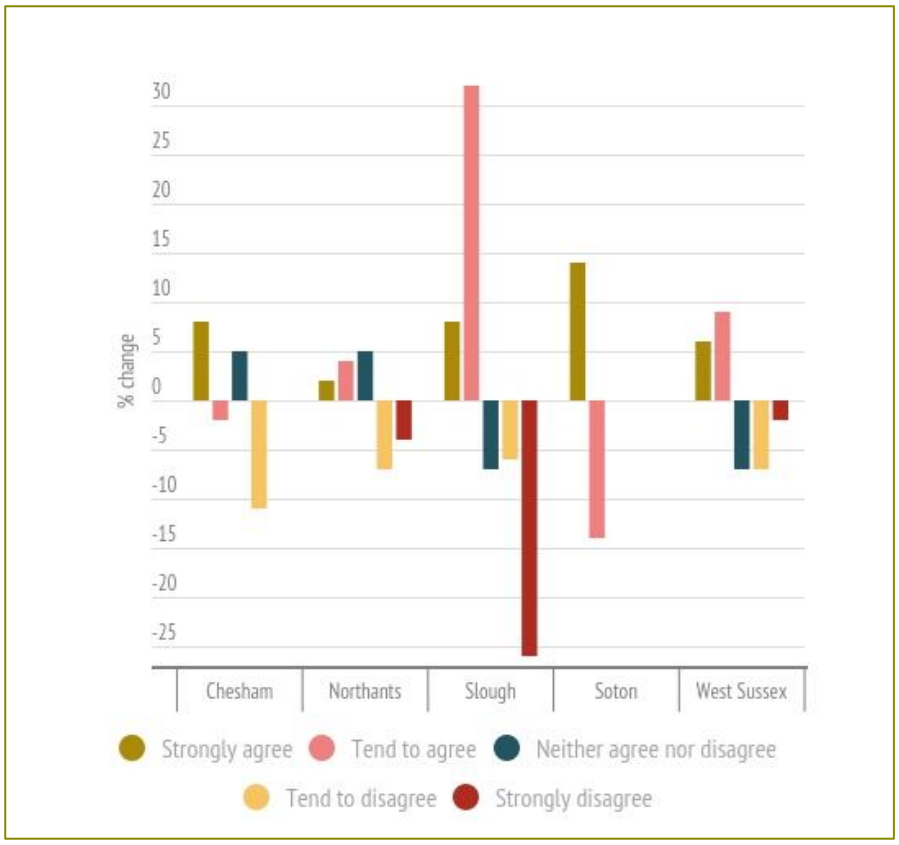


Figure 9.1: How much do you agree or disagree that: 'this area is a close, tight knit community' – percentage change baseline – Year 2[24]

Of the eight pathfinder projects that included the household survey question: '*The people in my community will help out if it floods*', Cornwall was the only one with a negative change in direction of data in Year 2, in comparison with the baseline – see Figure 9.2.

[24] Number of responses per pathfinder: Chesham: Baseline – 46; Year 2 – 19; Northants: Baseline – 139; Year 2 – 76; Slough: Baseline – 26; Year 2 – 170; Soton: Baseline – 7; Year 2 – 7; West Sussex: Baseline – 173; Year 2 – 198. Data from Rochdale has been excluded because of problems of data validity.

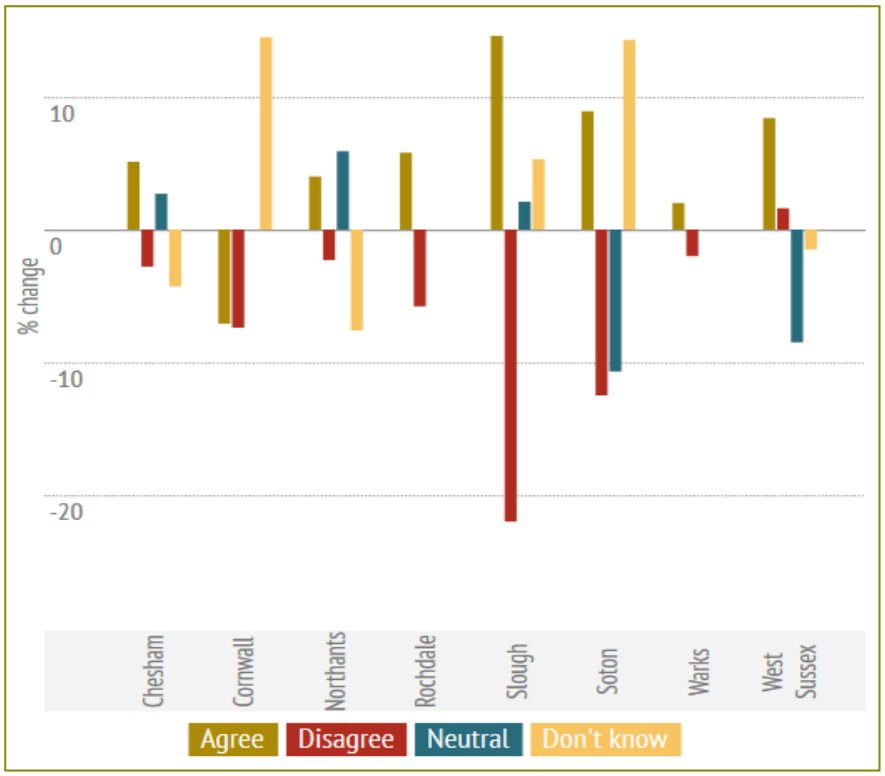


Figure 9.2: The people in my community will help out if it floods – percentage change baseline – Year 2[25]

There was a positive change in direction of survey data in Year 2, in comparison with the baseline, provided by eight pathfinder projects in answer to the question: '*In the last 12 months have you received any advice or support from any source about flood risk and how best to prepare for a flood?*' This indicates that pathfinder projects have succeeded in engaging households in their communities and raising flood awareness.

[25] Number of responses per pathfinder: Chesham: Baseline – 142; Year 2 – 53; Cornwall: Baseline – 210; Year 2 – 170; Northants: Baseline – 143; Year 2 – 82; Rochdale: Baseline – 44; Year 2 – 14; Slough: Baseline – 25; Year 2 – 170; Soton: Baseline – 8; Year 2 – 7; Warks: Baseline – 38; Year 2 – 34; West Sussex: Baseline – 177; Year 2 – 201.

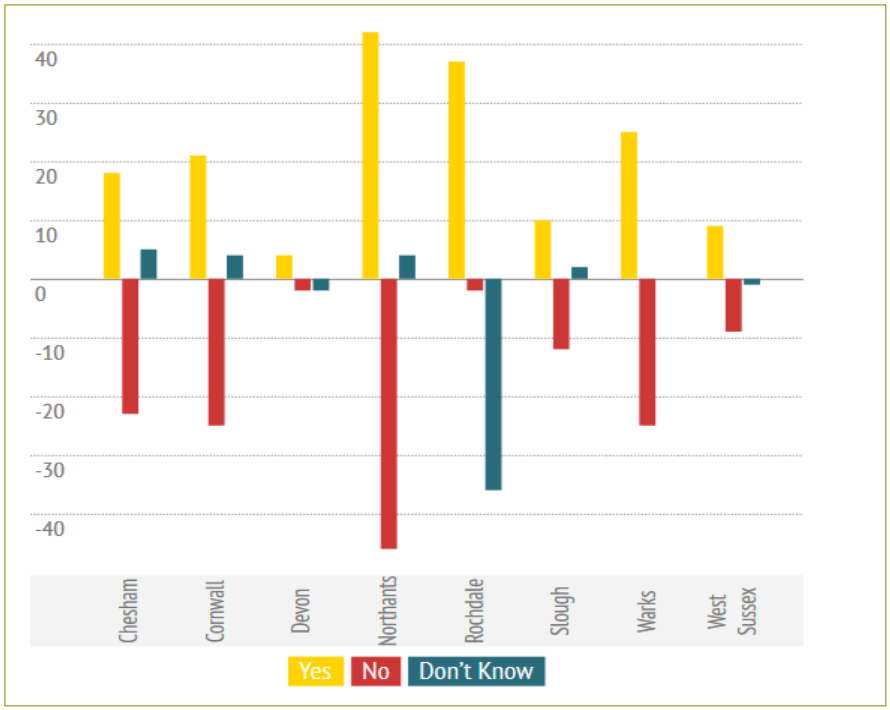


Figure 9.3: In the last 12 months have you received any advice or support from any source about flood risk and how best to prepare for a flood? Percentage change baseline – Year 2[26]

Data in response to the statement '*Protecting my home from a flood is my responsibility*' shows a positive change in direction for six of the eight pathfinder projects that included it in their household surveys at the baseline and Year 2. One of the aims of the Warwickshire pathfinder project was for communities across the county to take 'more responsibility for their resilience to flooding', however, household survey results suggest that further work is needed in this area (decrease of 12 per cent for respondents answering 'Agree' and increase of 12 per cent for 'Disagree').

[26] Number of responses per pathfinder: Chesham: Baseline – 142; Year 2 – 54; Cornwall: Baseline – 233; Year 2 – 179; Devon: Baseline – 115; Year 2 – 150; Northants: Baseline – 148; Year 2 – 85; Rochdale: Baseline – 42; Year 2 – 17; Slough: Baseline – 170; Year 2 – 169; Warks: Baseline – 329; Year 2 – 38; West Sussex: Baseline – 198; Year 2 – 221

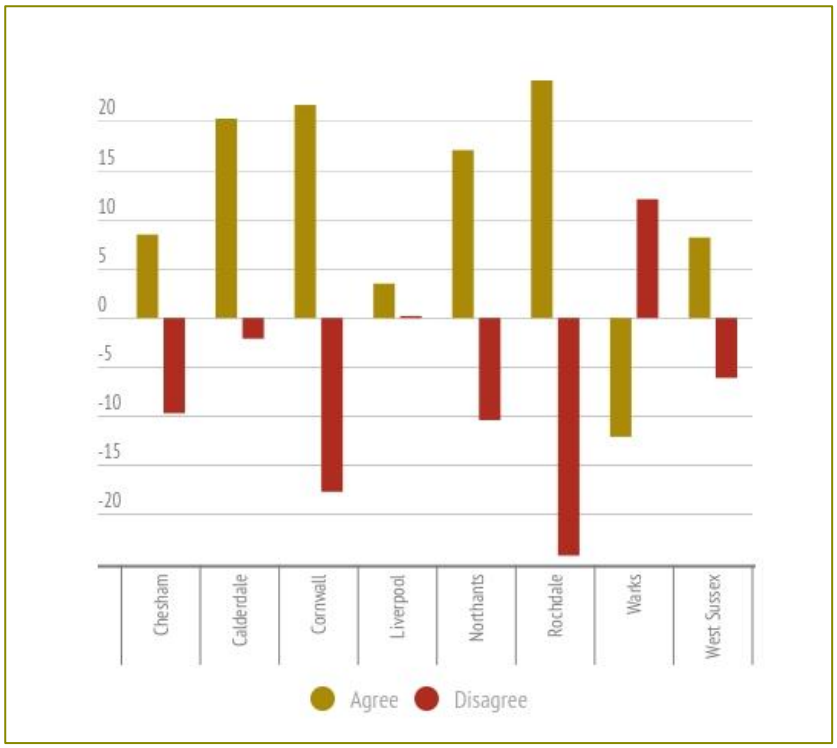


Figure 9.4: Protecting my home from a flood is my responsibility – percentage change baseline – Year 2[27]

Qualitative data

Evidence from the *Flood Resilience Community Pathfinder Evaluation REA* (Twigger-Ross *et al.,* 2014) suggests that the aim of awareness raising activities is to create links (linking capital) between citizens and agencies / organisations, creating and embedding networks as well as joining people together (bridging capital) in communities. All pathfinder projects have carried out many and varied activities to raise awareness of flood risk with citizens generally, which includes producing and delivering printed and digital materials, holding flood fairs, flood surgeries, and attending other events to talk about flooding.

Therefore, it is important to acknowledge the considerable overlaps between institutional resilience (which focuses on organisations and networks specifically working on flooding) and community capital where the focus is on wider community capacity, not directly concerned with the management of flood risk. Pathfinder projects have built on existing community capital to develop institutional capacity. This creates links from the community to wider resilience networks.

Across the pathfinder projects, key outputs in relation to institutional resilience that will have delivered indirect benefits to community capital include: 111 flood groups maintained

[27] Number of responses per pathfinder: Chesham: Baseline – 143; Year 2 – 54; Calderdale: Baseline – 82; Year 2 – 67; Cornwall: Baseline – 211; Year 2 – 175; Liverpool: Baseline – 81; Year 2 – 52; Northants: Baseline – 140; Year 2 – 74; Rochdale: Baseline – 36; Year 2 – 14; Warks: Baseline – 33; Year 2 – 33; West Sussex: Baseline – 176; Year 2 – 199. Date from Slough has been excluded because of problems of data validity.

or started (plus four flood groups have been established in Warwickshire from communities outside of the pathfinder area as an unexpected outcome); training for over 300 flood wardens in Cornwall and 109 in Devon; eight pathfinders[28] developed materials for engagement with schools, and one ran a play for three schools scripted by local writers and performed by third year degree drama students and one pathfinder taught 15 classes on water and land use.

With respect to community capital, specifically the linking citizens aspect, flood boxes / bags and flood information have been developed and delivered to individual households and businesses at risk in six and eleven pathfinder projects, respectively; and four videos / DVDs have been developed to raise awareness and to be used as community engagement tools. In terms of events that the pathfinders have arranged themselves, five carried out flood surgeries, three arranged county-wide community resilience to flooding networking events, eleven carried out flood awareness events / flood fairs, four had stands at larger events, two had wider river stewardship events, one held a film festival on water-related issues and three organised flood-related photography exhibitions.

It is difficult to evaluate the outcomes and impacts of awareness raising activities. Data provided by pathfinders on numbers of events and activities were variable and it was not always clear what the events entailed. Some pathfinder projects have used simple monitoring and assessment methods for online resources such as collecting numbers of visits to a website, repeat visits etc. or inviting people attending events to fill in a short questionnaire about what they have learnt. Responses to the household survey questions on levels of awareness of flooding and the community capital indicator data were the primary evidence sources.

Given these caveats, Table 9.2 presents data on activities, outputs and outcomes related to community capital. It is not certain how sustainable and robust the resultant networks will be in the long term but without the community engagement activities undertaken by all pathfinder projects, the proactive, collaborative approach would not have taken place and the new horizontal links between citizens would not exist. See section 14 for further discussion of pathfinder legacies.

[28] Blackburn with Darwen, Calderdale, Liverpool, Rochdale, Slough, Swindon and Warwickshire pathfinders

Table 9.2: Community capital activities, outputs and outcomes

Community capital activities	Outputs (examples from pathfinders)	Intended outcomes	No. of pathfinders carrying out activity
Development of social and educational media	• Chesham: *FloodSmart – A History of Flooding in Chesham* has had 520 views on YouTube and was shown to over 400 school children in two schools, FloodSmart Twitter account has 106 followers (25/6/15). • Calderdale: the 'eyeoncalderdale' website had 652 sessions conducted by 457 users (73 of which were Calderdale Council) from 31 March – 19 April 2015. • Devon: 14 flood groups were given help with disseminating information about local flood risk, flood warning systems or recruiting volunteers using social media, local websites, press releases and newsletters. • Liverpool: *Flood Awareness and Resilience Information DVD* (featuring Ricky Tomlinson) has had 1528 views online (24/6/15). • Northamptonshire: *Don't Be a Numpty* has had 1699 views on YouTube (24/6/15), online toolkit linked to Twitter and Facebook. • Swindon: Facebook page has 15 likes, *Flood Information and Guidance* video has had 141 views on YouTube (26/6/15).	• Increased engagement and awareness of flood risk and ability of community members to act effectively during a flood • Increased sharing of knowledge, skills and learning • Change in behaviours • Improved communication during flooding	10
Community learning events, fairs and surgeries / engagement of children and schools	• Blackburn with Darwen: attending neighbourhood association meetings and ward solution meetings to put flooding on the agenda. • Chesham: held 14 events in total, attracting audiences of around 800 people', 2 whole-school assemblies. • Calderdale: held 18 learning events with 380 attendees (including flume demonstrations, willow bund workshop, etc.) and ran classes on water and land use with 447 children at Calder High School and five primary schools. • Cornwall: 3 emergency planning events.	• Increased engagement and awareness of flood risk and ability of community members to act effectively during a flood • Change in behaviours • Increased bonds of trust between communities and formal institutions responsible for flooding	5

Community capital activities	Outputs (examples from pathfinders)	Intended outcomes	No. of pathfinders carrying out activity
	• Devon: 4 flood fairs, flood surgeries. • Liverpool: 4 flood fairs, 2 winter survival events, 6 surgeries; Liverpool: work with Valley Theatre to creatively engage children through developing and performing climate change plays in the area. Video of the flooding play has had 22 views on YouTube (24/6/15). • Northamptonshire: held more than 60 community meetings in total. • Southampton: held a community flood fair. • Swindon: held a flood surgery attended by 50 residents in an area which has not suffered internal flooding. • Warwickshire: held 7 countywide engagement workshops for the public and 1 networking event for flood groups. • West Sussex: ran 14 community resilience workshops and flood fairs with approximately 700 attendees, supporting junior citizen events and initiatives such as Duke of Edinburgh Award and Junior Neighbourhood Watch to reach 10,000 youths.		
Organisation of a flood film festival	• Blackburn with Darwen: umbrella art, installations and flood-themed film festival organised with People and Planet attended by 800 people to promote pathfinder work amongst the wider community.	• Increased engagement and awareness of groups of people beyond the 'usual suspects' (i.e. youths / children) of flood risk and ability of community members to act effectively during a flood.	1
Other community engagement / learning events	• Calderdale: ran 24 river stewardship events with 218 volunteers. • Cornwall: Cornwall Community Flood Forum networking events. • Northamptonshire: flood roadshow bus. • Rochdale: flood roadshow. • Warwickshire: network event, flood trailer.	• Increased engagement and awareness of flood risk and ability of community members to act effectively during a flood. • Increased sharing of knowledge, skills and learning. • Increased sustainability through established processes and governance.	5

Community capital activities	Outputs (examples from pathfinders)	Intended outcomes	No. of pathfinders carrying out activity
	• West Sussex: two Annual Peer Learning Workshops.	• Increased bonds of trust between communities and formal institutions responsible for flooding.	
Creation and dissemination of flood awareness materials to households or businesses	• Blackburn with Darwen: 10000 leaflets distributed to individuals, households and businesses. • Calderdale: 'eyeoncalderdale' website (see analytics above); flood reports to 49 businesses and 109 households. • Chesham: 2200 leaflets distributed, advertising Flood Smart, events, visualisation, etc. • Cornwall: community resilience guide, leaf litter project toolkit, booklet along with the accompanying emergency contact and safety card (8000+), 10,000 books. • Liverpool: information distributed to 38 at-risk properties. • Northamptonshire: community flood risk report distributed in 15 communities. • Rochdale: Household/Business Resilience Pack (300 households, 112 businesses). • Southampton: guide to the tide table and flooding has been developed by the Southampton pathfinder; 3 newsletters to 39 properties. • Swindon: Flood plans to 200 households.	• Increased engagement and awareness of flood risk and ability of community members to act effectively during a flood. • Increased sharing of knowledge, skills and learning. • Improved communication during flooding – residents and businesses know who to contact.	12
Distribution of flood packs / grab boxes to households or businesses	• Blackburn with Darwen: packs distributed to 250 households. • Chesham: 122 rucksacks given to households. • Northamptonshire: 14 flood wardens given grab bags. • Rochdale: 800 approx. grab bags distributed at events. • Warwickshire: over 25 grab boxes at countywide events, 13 to flood groups and 12 to parish councils.	• Increased engagement and awareness of flood risk and ability of community members to act effectively during a flood. • Increased community ownership and empowerment. • Improved organisation during a flood. • Reduction in flood damage.	5

Community capital activities	Outputs (examples from pathfinders)	Intended outcomes	No. of pathfinders carrying out activity
Organisation of public engagement events / photography exhibitions	• Chesham: photography exhibition illustrating historical flooding in the area '*Got media attention, there was positive feedback and it was not expensive'* and holding a Flood Forum in Amersham (April 2014). • Rochdale: mobile exhibition. • Swindon: flood exhibition.	• Increased engagement and awareness of flood risk and ability of community members to act effectively during a flood.	8

Key outcomes from pathfinder project activities related to enhancement of community capital include:

- **Local networks, peer-to-peer and partnership working to build community resilience to flooding have been developed:** good working relationships with project partners and community groups have led to shared ownership and implementation of governance processes. Development of horizontal links / networks between citizens (e.g. through the 111 flood groups established and maintained by pathfinder projects, the process of developing and practicing flood plans, and as an secondary effect of attending flood fairs, and other awareness raising activities); and community involvement in practical measures (e.g. voluntary gully cleaning, riparian management, culvert watching, attenuation ponds, etc.) will improve sustainability of interventions.

- **Both disparate and close-knit communities have been brought together to limit the impacts of flood risk, as observed by this interviewee:**

  'Communities have started to come together to limit the impacts that could happen again….You can see in some areas that any animosity has been put to one side and they want to sort things out…. It's been really nice that those smaller communities that are very close and care about the people around them, even though they aren't affected but want to help their neighbours.' (Interviewee 12PM)

- **Awareness, community empowerment, ownership and confidence have been increased through a consistent and repetitive approach to community engagement:** *'Pathfinder created the time to do this'* (Interviewee 5PM). This is in evidence from the number of flood groups and flood wardens trained by pathfinders (see section 7 for further details).

- **Communication and understanding of roles and responsibilities around flooding has improved:** this has helped to increase understanding, trust between communities and institutions, and to manage expectations. For example, flood groups have created strong links with governmental and non-governmental

organisations. Many pathfinders reported that, as a result of pathfinder community engagement work and development, individual officers from the local authority or Environment Agency will now contact members directly to become involved in various activities, such as ward forums, schools sessions, etc.

- **Engagement in community networks of youths and children has increased:** for example, applying different approaches both Rochdale and Warwickshire pathfinders have achieved positive outcomes from engaging with schools and school children. Rochdale focussed their attention on providing activities to engage young people through local Scout groups. Whereas for the Warwickshire pathfinder the aim was to raise the awareness of flooding among students and to teach them about the risks and adaptation measures with the aspiration that this knowledge would be passed onto their parents.

- **A strong base of information and innovative approaches have been developed that can be built on going forward.** For example, Northamptonshire's online toolkit as described in Box 9.1.

It is difficult to gauge the long-term impact these activities will have, particularly one-off events such as Blackburn with Darwen's film festival and Chesham's photography exhibition, and top-down outputs such as e-learning packages and online toolkits, and these would need to be measured in the future to see if they have worked.

Box 9.1: Northamptonshire pathfinder case study: Online toolkit

This website has been designed to be the single place people need to visit for information regarding a flooding emergency, or a flood information request or to find real time information about local rainfall and flood risk. The website is designed to be of use to local communities, individuals, other authorities and experts.

The toolkit will help individual residents, communities and local businesses to:

- Identify their risk
- Be prepared
- Mitigate

The main tools that are piloted on the toolkit are:

- Community flood risk and impact reports
- Community flood risk and mitigation investigations and surveys
- Community flood event information
- Community rain gauge and warning system information and intelligence
- School education material
- Community funding mechanism research
- Community flood store information
- Community emergency plans
- Community flood forum information
- Community flood group information such as Flood Wardens

The outcomes of the on-line tool kit are:

- An innovative and fit for purpose on-line toolkit for the on-line community to have the information and tools to improve flood resilience though identification, being prepared and mitigation
- The Parish Councils, community groups and individuals directly involved in piloting the tools and online toolkit will have an improved awareness and understanding of their flood risk and some of the measures they can take to improve their areas and own flood resilience
- Expect some audiences to act upon the information gained from the tools or online-toolkit and take

up community flood resilience measures

- County Council departments, primary stakeholder organisations supporting residents, business and communities, and primary community organisations like Parish Councils and Resident Associations will be aware of the online information and its contents
- Individuals will be more informed about community flood resilience and/or willing to spread the message that everyone can positively contribute to improving their community's flood resilience.

Box 9.2: Devon pathfinder project team case study: Building community capital in Braunton

Background

Braunton is a large village in North Devon, with a population of 8,128 people. It's a very popular holiday destination. About 500 properties are at risk of flash flooding, from the River Caen and small tributaries such as the Chapel Stream, as well as surface water flooding. Vulnerable locations include a primary school, police station, youth hostel, library, parish council offices, health centre and day centre. During the summer there's an influx of visitors, who are also vulnerable because they are unfamiliar with the flood risk and may not speak English.

The most recent flooding occurred in 2012, when Braunton suffered two flood events on 22 December due to persistent rainfall. At that time, there was no community sand bag store. Although Braunton had a Community Emergency Plan, there were problems implementing it during the 2012 floods.

Project objectives

Braunton was included in the Defra funded Devon Community Resilience Pathfinder project. The five project aims for Braunton were to:

1. raise flood awareness,
2. help review the Community Emergency Plan,
3. help train emergency response volunteers,
4. supply community resilience equipment, and
5. establish a local flood warning system that would alert the community to the possibility of flooding.

Flood awareness

The Community Response Team worked alongside the project team to raise flood awareness. Although the Community Emergency Plan will help organise any relief effort, the community must not rely on the plan alone:

"What we need to emphasise is that there needs to be an individual response. The Community Response Team isn't there to sandbag people's houses. It's essential for people who live in the flooding areas to have their own measures in place – have their own stock of sandbags or door boards. People have got to be self-reliant and prepared." (Braunton Community Response Team spokesperson)

An Environment Agency sand bag demonstration trained people to sandbag their doors to minimise damage to their properties.

Reviewing the Community Emergency Plan

Braunton's Community Response Team comprises volunteers from Braunton Caen Rotary Club, parish councillors, residents and local businesses. They immediately saw the advantages of the project's funding and specialist assistance, seizing the opportunity to review the Community Emergency Plan in collaboration with the project and using lessons learned from the 2012 floods. In a matter of months, the plan was updated, tested and launched.

The Environment Agency provided advice to the Community Response Team, including:

- flood warnings, flood forecasting and how these 'triggers' could be incorporated into the Community Emergency Plan
- what actions could be taken before, during and after a flood to help the community stay safe and minimise damage.

Police and Fire and Rescue teams also advised the Community Response Team on emergency response. This has strengthened their relationships with Emergency Responders and both parties know they can call on and support one another to deal with local flood incidents. For example, the Community Response Team shares their local knowledge to advise Emergency Responders on the location of flooded roads or where vulnerable people are.

Training

Devon County Council organised flood warden training, to build confidence and help the Community Response Team to understand flood risk, how it's managed, how to stay safe during flood incidents and how to work alongside Emergency Responders. It was delivered by the Environment Agency, Devon and Somerset Fire and Rescue Service and a representative from Cornwall Community Flood Forum.

Community Resilience Equipment

The project funded the provision of community resilience equipment, which includes personal protective equipment such as high visibility jackets, as well as road signs, walkie-talkie radios, sandbags and sandbag hoppers. The equipment list was drawn up as a consequence of writing the Community Emergency Plan.

Conclusions

The review process helped Braunton Community Response Team understand the roles and responsibilities of all the organisations that can help with managing flood risk and emergencies.

"The assistance we received in constructing the existing plan, particularly the flood element, was invaluable. I am confident that we can now provide a more coordinated and controlled response." (Braunton Community Response Team spokesperson)

Box 9.3 : Chesham pathfinder case study: Influencing perceptions of flood risk using the FloodSmart flood risk visualisation tool

Focus

Previous work in Chesham had identified a lack of awareness of and interest in flood risk as a barrier to flood-related work and community engagement. The FloodSmart project aimed to influence residents' perceptions of flood risk through many different activities, including the creation and dissemination of a flood risk visualisation tool. Work on the tool itself was initiated in May 2014 and completed in September 2014, while demonstration of the tool to residents took place from September 2014 to March 2015.

What did you do?

This case study covers two related activities: the creation of the tool (as part of work package 2) and the delivery of personal conversations with residents to demonstrate the tool (work package 1). The actual production of the tool was contracted out to a consultancy, but the FloodSmart partnership and the Chesham Flood Action Group were closely involved in designing the tool, providing feedback on initial options as well as the draft version. The tool is based on the use of GIS layers to present information. It includes: several options for the base map (aerial photography, a street map and a historical OS map); layers showing the different flood depths for surface water and fluvial flooding as well as flood velocities on roads; locations of completed flood alleviation schemes; plotted photographs of actual flooding in Chesham, both past and present.

Once the tool was ready, a training session on how to use the tool was organised for the National Flood Forum (NFF) and the Chesham Flood Action Group. The NFF was tasked with organising and delivering the one-to-one conversations with residents; drumming up interest was done by way of events with community groups, a leaflet in the local printed press and small posters placed in the neighbourhoods at highest risk

What were the objectives and how were they met?

The activity's objective was to create an easy-to-use flood risk visualisation tool as well as to improve Chesham residents' understanding of flood risk by holding conversations with them using the tool.

What were the outputs and outcomes?

This activity's outputs were on one hand the creation of the visualisation tool, uploaded to a tablet (as well as that of an additional 'fly-through' video showing an aerial view of what Chesham would look like during a 1 in 1000 year event), and on the other the delivery of around 40 in-depth conversations with residents using the tool and the securing of further involvement from four of these residents, in the shape of surveys (3) or interest in the runoff reduction grant (1). The tool was used during several awareness-raising events and was also presented to the Chesham Environmental Group, creating further opportunities for discussions.

In terms of outcomes, the residents who benefited from the personal conversations reported an improved understanding of their property's flood risk, as well as Chesham's flood risk and how it might affect them (e.g.

by making roads they use impassable). Participants valued the personal conversations using the visualisation tool because they offered the chance to discuss their personal concerns (about flooding on the wider scale but also and particularly on the individual property scale) with an individual knowledgeable about flooding at the national, strategic level, but also locally to Chesham.

Residents valued the personal tailoring, by being able to direct the conversation as to their interests, but also having someone to help them to navigate through the tool as best suited them. Some of the participants do not have access to a computer, so didn't feel confident at first using the interactive tablet format, but support and explanation helped this. Several residents said that they valued the fact that they were able to receive further guidance beyond the scope of the visualisation tool, such as Property Level Protection advice and demonstration, insurance advice, discussion of local flood projects and leaflets to keep.

Lessons learned

What worked well?

Feedback received from FloodSmart partners and the Chesham Flood Action Group about the tool during the draft tool presentation session and the tool use training session was positive, in terms of how information was presented and the ease of use of the tool. In addition, feedback about the tool from residents following the one to one sessions was positive, and they responded particularly well to the interactive nature of the tool, the photos showing past flooding in town and the ability to manipulate layers using the tablet functions.

What challenges were experienced in delivering the activity and how have these been addressed?

The main challenge related to the one-to-one conversations, specifically the difficulty encountered in setting up the sessions themselves. Once sessions were held, the feedback was positive, and a high proportion of interviewees took follow-up action, but very few residents replied to the National Flood Forum's repeated and varied efforts to organise the sessions in the first place. After promotion through a well-read local publication generated no interest, the NFF implemented some alternative ideas, which fared better but still generated little interest. Although this demonstrates the difficulties of engaging with communities at risk, a possible partial solution would be to put the tool online to allow residents to access it independently, as detailed below.

Conclusions

The tool itself is an important and useful resource for communicating flood risk, and can easily be replicated in other areas. The tool was designed to be used offline, on the tablet or on laptops using a memory stick. However, it was built with the ability to be easily transferred to online use, and Buckinghamshire County Council is currently commissioning this work. Although careful thought will be given to the scale of the maps, the sensitivity of information presented and the need to signpost to further resources, this could be an excellent way of reaching people via smartphones, tablets and PCs. If the online "self-service" version of this tool generates positive feedback, this option will be recommended to others.

Learning points

The involvement of volunteers in practical activities (e.g. river stewardship in Calderdale) is likely to contribute to building relationships of cooperation and trust between members of the community.

It is important to find the appropriate balance between developing community capacities for managing flood risk and expecting communities to take on all aspects of identifying risks, developing plans and implementing actions. The Calderdale pathfinder took the decision to work with the University of Leeds to gather detailed information on land management and flooding issues, rather than to use local volunteers for this. Volunteers have had an active role in catchment stewardship activities in the area, but for this activity it was felt that using the skills offered by Leeds University would be a better use of

resources. The community will benefit from the knowledge gathered, but will not do the actual work.

Key messages

- **Factor in time to develop community skills and capacities.** People bring their own skills and capacities to community groups such as flood groups but most need to develop other capabilities, for example in working with others or understanding their own role in flood risk management. Local people and community groups are important primarily as agents of local flood resilience rather than as contacts or consultees. Recognise that local groups need to define their own priorities and develop ways of working and see what support can be provided for this work.
- **Promote the use of locally-relevant and entertaining media and think of what will appeal to different audiences**. The projects provide a lot of inspiring examples of how to get through to audiences old and new: much of this can be used by others, either directly or to spark new ideas.

10. Building Communities' Capacity for Flood Risk Resilience: Economic Resilience

Key findings

- Three of the 13 pathfinders (Blackburn with Darwen, Liverpool and Rochdale) started with low levels of economic and financial resilience. Other pathfinders had some characteristics of low economic resilience such as low levels of home ownership and flood insurance.
- Eleven of the 13 pathfinder projects developed activities to increase economic resilience: eight promoted increased access to flood insurance; seven worked to improve the flood resilience of local businesses; and nine took measures to increase access to financial resources.
- Four pathfinders tried to negotiate better terms for flood insurance with local brokers but had limited success, mainly because the process of reaching an arrangement over Flood Re was going on at the same time.
- Across the pathfinders 1,088 businesses received information about their flood risk; of these, 710 completed flood plans (Blackburn with Darwen), 23 received grants for physical improvements to their premises (Calderdale) and 40 signed up for Environment Agency flood warnings (Calderdale).
- Three local authorities provided funding for local flood groups; this was not always as part of the pathfinder.
- Many pathfinders found working with local businesses challenging; two pathfinders that ran successful programmes to increase business resilience to flooding developed these in partnership with experienced and trusted local intermediaries.

What is meant by economic resilience?

Economic resilience refers to the economic vitality of both individuals and the community, including housing capital and ownership, equitable incomes, employment and business sustainability.

Financial resilience, or the ability to access the financial resources needed to prepare for and recover from the impacts of flooding, is an important component of economic resilience. As set out in the project specification, one of the three main objectives of the pathfinder scheme was to, *'Demonstrably improve the community's financial resilience in relation to flooding'.* Defra was particularly interested in gaining evidence of ways to increase the uptake of household insurance. Evidence shows that having greater financial resources can increase resilience to flooding.

Other variables which give an indication of economic resilience at a household level are home ownership (owning one's own home is an economic resource which gives greater stability and makes people better able to cope with the impacts of flooding) and employment status (being in a stable working situation ensures a regular income). At a community level, the existence of local businesses that generate economic activity and wealth, as well as the extent to which these businesses are able to cope with and bounce back from flood events, are important indicators of community economic resilience.

Reflecting on the baseline and Interim Report

Key points from the baseline

Overall, the baseline evidence showed a mixed picture of economic resilience across the pathfinders. Some pathfinders scored poorly across a number of indicators, suggesting a low level of economic resilience (Liverpool, Blackburn with Darwen and Rochdale). In other pathfinders, economic resilience appeared to be weak in some aspects but not others: this was the case in Southampton, where home ownership was low and householders reported concerns about the affordability of home insurance. Many of the pathfinders were in areas where economic resilience appears to be relatively high, according to the baseline evidence.

Table 10.1: Key points from the baseline on economic resilience capacity of pathfinders

Aspect of economic resilience	Baseline data
Home ownership	Data from the 2011 Census indicates that in two of the pathfinder areas (Belle Vale ward in Liverpool and Southampton), less than 50% of households owned their own homes. The level of home ownership was also low in Slough (52.7%). Of the nine pathfinders including this question in their household surveys, all but two (Slough and Swindon) found that the majority of respondents owned their homes.
Employment	Across the pathfinders, the percentage of the population who were employed at the time of the 2011 Census (61.8%) was similar to the national average (62.1%). The average of people employed was under 60% in three pathfinders (Blackburn with Darwen, Liverpool and Rochdale), while the highest levels of employment were recorded in Chesham (67.1%), Northamptonshire (66.6%) and West Sussex (66.0%). For all the pathfinders providing data on employment, the majority of respondents were either working as employees or in the category of 'other' occupations.
Household insurance	In six of the nine pathfinders providing information on household insurance, the majority of respondents had some form of flood insurance. Liverpool was the only pathfinder that had more respondents without some form of flood insurance (54%) than with (41%). A relatively large proportion of respondents in Chesham and Slough were unsure whether they had some form of flood insurance. Affordability of insurance was found to be an issue especially in Chesham, Cornwall, Rochdale and Southampton. A relatively large proportion of respondents in four pathfinders believed that their insurance provided adequate cover for the risks associated with flooding, but respondents in two pathfinders did not.
Deprivation	Data from the Government's Indices of Deprivation (2010) show that in three of the pathfinders, over 20% of the area is in the top 10% of most deprived areas nationally

Aspect of economic resilience	Baseline data
	in terms of income. These are: Liverpool (40.9%), Blackburn with Darwen (33.0%) and Rochdale (28.9%). Chesham and Devon have no areas in the 10% most deprived.

Key points from the Interim Report

At the Interim stage, pathfinders reported limited progress in achieving outputs relating to economic resilience, mainly as a result of problems arising from the process of developing a national approach to financing flood insurance which are described below. In terms of increasing business resilience, awareness raising materials such as flood packs and leaflets had been distributed to businesses at risk in Blackburn with Darwen, Cornwall, Slough and Rochdale. In Rochdale, one business had helped to create a flood action plan. Blackburn with Darwen had contacted 245 businesses about completing a flood plan: as a result, 33 businesses signed up to flood warning services, three received advice about bespoke flood plans and ten were able to access to a store of sandbags to help them protect their businesses. West Sussex's work package with businesses had been delayed by staff changes but they intended to proceed.

In relation to increasing access to funding for community food resilience initiatives, West Sussex had created its own funding mechanism.

To what extent was building economic resilience a goal for pathfinders?

Pathfinders that carried out activities to increase economic resilience focused mainly on three areas:

- Promoting and increasing access to insurance cover to ensure that residents and local businesses have sufficient resources to replace or restore any assets affected by flooding, to cover additional expenses incurred and to supplement income lost, for example as a result of businesses being unable to function or employees being unable to get to work.

- Helping local businesses prepare for and be better able to withstand the impacts of flooding both in terms of the direct consequences of flooding of their premises as well as indirect impacts such as disruption of transport, knock on effects of flooding on clients and suppliers and increased uncertainty and lack of confidence.

- Increasing access to funding for community flood resilience initiatives.

Promoting and increasing access to insurance cover

Seven pathfinders carried out activities to promote better access to affordable insurance cover. The activities are summarised in Table 10.2

Table 10.2: Pathfinders' activities to increase access to affordable insurance cover

Pathfinder	Economic resilience category / activity	
	Work with insurers to reduce premiums	Promote flood insurance
Blackburn with Darwen		Information provided informally by Flood Watch team; information mailed out on request.
Calderdale	Exploratory conversations and meetings with insurance providers and with a local insurance agent.	Information provided at events.
Chesham		Information provided at all events.
Cornwall	Negotiations with municipal insurers to arrange insurance cover for flood wardens.	Information on website and in 10,000 booklets.
Liverpool	Advice from charity on brokering and making insurance claims.	Information to all at-risk properties.
Northamptonshire		Information to all 15 communities via the flood bus visit, leaflets, discussions and within the online toolkit.
Rochdale		2 flood roadshows. 1 property / business resilience pack. 1 flood action group.
Swindon		Information provided at flood surgeries, exhibitions and meetings with flood groups. Educational resources incorporating information about insurance developed.
Warwickshire	Conversations and meetings with one local insurance broker.	

Four pathfinders engaged with insurance companies with a view to negotiating better terms and/or reduced premiums for properties in the pathfinder area. The aim was to influence the insurance companies and get agreements that would cover part or all of the pathfinder area. Warwickshire and Calderdale were each able to reach local agreement with an individual insurance company to improve household insurance terms in the light of community resilience measures. Liverpool provided advice for individuals to negotiate with insurance companies.

Cornwall was different from the other three pathfinders, as here negotiations focused on providing insurance cover for volunteer flood wardens. Cornwall was successful in identifying and coming to an agreement with an insurance company that was able to provide this insurance cover.

Other pathfinders had planned to negotiate with insurance companies, but decided not to go ahead while the national negotiations on Flood Re arrangements were ongoing. Five pathfinders promoted insurance cover at public meetings and events.

Increasing the flood resilience of local businesses

Seven pathfinders worked with local businesses to find ways of increasing their resilience to flooding. A focus for much of the work with local businesses was to encourage them to develop their own flood plans so that they would be better prepared for a flood event and might be able to identify measures to flood proof their premises. The Calderdale pathfinder developed a number of initiatives with local businesses, including flood surveys and grants for property resistance or resilience measures. Blackburn and Darwen, Calderdale and Rochdale reported that business flood plans had been developed: the number of businesses developing plans was 710 in Blackburn with Darwen, 50 in Calderdale and one in Rochdale. Blackburn with Darwen's Evaluation Report included a testimony from a local business that had developed a flood plan. This is an important step in ensuring that businesses have mechanisms in place to deal with flood events.

In the rest of the pathfinders that worked with local businesses, the contacts made had not led to further work by the end of the pathfinder period and there was little evidence about whether the initial information provided led to a change in flood preparedness.

Table 10.3: Activities carried out by pathfinders that focused on increasing the flood resilience of local businesses

Pathfinder	Economic resilience category / activity:	
	Business engagement	**Flood plans for businesses**
Blackburn with Darwen	710 businesses contacted.	All businesses contacted have a flood plan.
Chesham	150 businesses contacted	Flood plans were promoted in contacts with businesses.
Calderdale	53 businesses involved with the project. Two thirds of businesses engaged have signed up for the EA flood warning service. 49 flood surveys of business premises. 23 businesses benefitted from grants for property resilience or resistance measures.	50 businesses have flood plans in place as a result of the pathfinder.
Cornwall	60+ businesses involved with project.	Over 60 businesses were offered support to complete flood plans. None took up the offer.
Liverpool	No work in pathfinder area but work with businesses in other parts of Liverpool and through business forum.	The Environment Agency and Liverpool City Council made a presentation to waterfront stakeholders on how to develop a flood plan. Promotion of Environment Agency's '*Would your business stay afloat?*'

Pathfinder	Economic resilience category / activity:	
	Business engagement	Flood plans for businesses
Northamptonshire	Work with business in 2 industrial parks: awareness raising meetings and activities.	Businesses in 2 industrial parks were encouraged to develop flood plans.
Rochdale	Visits and contacts with 112 individual businesses. 2 business workshops. Development of a Property/Business Resilience Pack. Meeting of local Heywood Business Forum.	1 business flood plan was developed.

Access to funding for local flood resilience measures

Table 10.4 shows that nine pathfinders provided information or support for local residents to access funding for flood resilience measures. In most cases, this support took the form of written information or advice which was made available online (e.g. through Northamptonshire's online toolkit) or at meetings and events. Calderdale developed relationships with a number of other organisations (Community Foundation for Calderdale, the Northbank Forum and the local Credit Union) in order to facilitate access to funding opportunities for local people. West Sussex set up a funding programme (Operation Watershed) using the local authority's own resources.

Table 10.4. Economic resilience activities, outputs and outcomes

Economic resilience activities	Outputs (examples from pathfinders)	Intended outcomes	No. of pathfinders carrying out activity
Promoting and increasing access to insurance cover	• Chesham: Information provided to participants at all public events. • Cornwall: Agreement with insurers on insurance cover for flood wardens. • Liverpool: Advice from charity on brokering and making insurance claims. • Northamptonshire: Information to 15 communities via flood bus visit, leaflets, discussions and within the online toolkit. • Warwickshire: Conversations and meetings with one local insurance broker; 2 flood roadshows; 1 property / business resilience pack.	• Members of the public aware of need to have flood insurance and how to go about obtaining it. • Increase in number of properties covered by flood insurance. • Household flood insurance policies provide better cover and conditions.	7
Increasing the flood resilience of local businesses	• Blackburn with Darwen: 710 businesses contacted and helped to define flood plan. • Calderdale: 35 businesses have signed up for Environment Agency flood warning service; 49 flood surveys of business premises; 23 businesses benefitted from grants for property resilience or resistance measures. • Rochdale: 2 business workshops were held; a Property/Business Resilience Pack has been developed; information on flooding was provided at a meeting with the local Heywood Business Forum.	• Businesses suffer less damage from flood events by planning, getting early warnings and putting precautionary measures in place. • Businesses can access financial resources to help them cope with the impacts of flooding and continue operating. • Reduced disruption of local business activity as a result of flooding avoids negative impacts on local jobs, the supply chain and the level of economic activity.	7

Economic resilience activities	Outputs (examples from pathfinders)	Intended outcomes	No. of pathfinders carrying out activity
Promoting access to funding for flood resilience measures	• Chesham: Provided information to the flood group and as part of project flood stalls at 3 meetings / events. • Calderdale: 2 flood groups received funding (£1000 each) from Community Foundation for Calderdale; 1 resident obtained a Credit Union loan to put a waterproof foam filling in the property's cavity wall. • Northamptonshire: Information on accessing funding included in online toolkit. • Rochdale: Regional Flood and Coastal Committee grant (Green Deal) obtained to pay for 35 flood resilience surveys at targeted properties and Green Deal Assessments for 35 properties; LLFA provided funding support for legacy programme in 2015/16. • Slough: Provided funding for two flood groups. • West Sussex: 129 applications for local grants were supported in 2013/14; in 2014/15 Operation Watershed Active Communities Fund was set up with the local authority's own resources and has been providing funding for flood groups.	• Flood groups become established and are able to develop their work more quickly because basic expenses are covered. • Flood groups and individuals have the financial resources to carry out flood resilience measures.	9

To what extent have pathfinders succeeded in building economic resilience in their communities?

Nine of the pathfinders developed activities to help flood groups access funding to support their activities. These are detailed in the table below.

Table 10.5: Activities carried out by the pathfinders to promote access to funding for flood resilience measures

Pathfinder	Actions to promote access to funding
Chesham	Information provided to the flood group and as part of project flood stalls at 3 meetings / events.
Calderdale	2 flood groups have received funding (£1,000 each) from Community Foundation for Calderdale; flood groups were put in contact with Northbank Forum for further funding advice. 1 resident obtained a Credit Union loan to put a waterproof foam filling in the property's cavity wall.
Cornwall	Advice to 47 parish/town councils and community flood groups.
Liverpool	Residents Association / flood action group provided with advice on grants.
Northamptonshire	Information included in online Flood Toolkit.
Rochdale	Regional Flood and Coastal Committee grant (Green Deal): 35 flood resilience surveys at targeted properties. Green Deal Assessments for 35 properties. LLFA funding support for legacy programme 2015/16.
Slough	2 flood groups received grants for administration.
Warwickshire	Information provided to 3 flood groups.
West Sussex	2013/14: 129 applications for local grants were supported. 2014/15: Funding applications were made through Operation Watershed Active Communities Fund.

Promoting access to affordable insurance

Half of the pathfinders carried out some activities to promote the take up of insurance by local residents or businesses. Several included information about flood insurance in their regular stalls and information activities. The Chesham pathfinder commented that they got a good response when they referred interested people to the NFF's insurance helpline as this made it seem like something they could get on with and 'do today'. It also led to some good conversations.

Warwickshire put considerable effort into developing local relations with insurance companies and was able to make the case to one company.

> *'In Kenilworth, I've tried to work with an insurance group and discussed the fact [the community has] got CCTV and they have said (and have put it in writing) that they will take this into account and look at it on a household level'. (Interviewee 12PM)*

However, other companies approached did not respond and there was considerable cost involved in having to negotiate individually with insurance companies.

Calderdale's negotiations with an insurance provider resulted in four households either being insured or finding more reasonably-priced insurance. There was also an increase in awareness and uptake of insurance across the pathfinder more generally, with the proportion of householders saying they had contents insurance increasing from 44 per cent to 73 per cent.

Cornwall was successful in negotiating liability insurance for flood wardens in Lostwithiel who had completed insurance industry-approved training. Ensuring that a financial safety net is in place for volunteer flood wardens who suffer accidents or injury is a critical element for building this kind of community and institutional capital.

Promoting the flood resilience of local businesses

Working through an intermediary organisation proved successful in Blackburn with Darwen. The local third sector organisation was able to establish good rapport with businesses. By providing information on flood plans they offered a product that would be of value to each business:

> *'The work with businesses has also gone well in Blackburn in terms of building resilience as each of them now have a flood plan and information about how to make their properties and their businesses more prepared during a flood event'.* (Interviewee 1PM)

Box 10.1: Blackburn with Darwen pathfinder case study: Business engagement – Know your risk, be prepared, have a plan

Focus

Businesses are a key part of any community and it is important that in a flood event they are resilient. In 2012 after very heavy rainfall and a blockage in the River Darwen which runs under the main road through the town, many businesses were flooded. At the start of the pathfinder some businesses were still struggling and had not implemented any flood procedures. The work with Darwen businesses was carried out during 2013/2014.

Activity

Newground, a local social enterprise, worked as a partner within the Flood Watch programme and recognised that businesses would not come looking for support. So Newground advisors 'hit the streets' and cold called in to as many businesses as possible, using a 'drip feed' approach to avoid information overload and enable businesses to get to know the advisors and warm to their messages Newground promoted an approach based on the 'know your risk, be prepared, have a plan' idea, through discussion, printed materials and social media.

Objectives and outcomes

The objectives were to engage 200 businesses, educate 50 businesses and contribute to increasing business sign up to flood warnings. Over 700 businesses across the borough have been engaged and all of these businesses have a flood plan. With the engagement approach that was developed all these businesses have been educated. Some good examples include Lucite International, where a bespoke flood plan was developed and information was provided for 100 employees at a training and awareness session on flooding. Flooding has also been included in the induction procedure. Ritherdon and Company Ltd also have a bespoke flood plan and now regularly check a surface water drain in the back street between their factory and adjacent terraced properties which contributed to the terraced properties being flooded in 2012. Teal Furniture flooded in 2012 and lost valuable stock. A tailored flood plan is now in place and a flood barrier is fitted every night as part of the shutdown procedure to protect the site from flooding in the night.

Lessons learned

The persistent engagement approach has been successful with businesses. Businesses are not always

aware of risk or may have some idea but limited time or resources to consider the implications. Drip feeding information allows small changes to be made that have an impact (quick wins): these include signing up for flood warning, checking insurance documents, moving stock and valuable items to a higher level, keeping key contact information to hand and regularly checking the weather. Investing in flood protection products such as flood barriers only tends to be considered when significant losses have occurred. Many small businesses cannot afford to implement these measures without funding support.

Conclusions

Business engagement can be successful with a good strategy of engagement, repetition and persistence. Knowledgeable, experienced advisors are essential to deliver this type of work.

Through the engagement with the pathfinder, some businesses in Blackburn with Darwen became aware of blockages in drains on or near their properties and took action to clear these blockages. This had benefits in terms both of reducing the business' own flood risk and in reducing flood risk to other commercial and residential properties in the area.

Calderdale was the only pathfinder to carry out sustained work to encourage local businesses to make physical changes to increase the flood resilience of their properties. A report commissioned through the pathfinder highlighted the negative impacts of flooding on the business community and therefore on the local area. Only 18 out of 53 businesses surveyed agreed that they had adequate insurance to cover damages in the event of another flood. Impact mapping shows that if insurance cover remains inaccessible to local businesses, the impacts on employees are likely to be more severe and gains for local refurbishment trades less positive, as well as more business closures. This leaves the business community vulnerable to future flooding.

The pathfinder worked with 53 businesses: flood risk surveys were carried out on the premises of most of these and 23 received grants for carrying out the work needed. 50 of the businesses developed flood plans, 72 per cent signed up for flood warnings, which was good evidence that they were more aware of their flood risk and taking action to prepare for and manage it. A survey carried out at the end of the pathfinder found that over two-thirds of business-owners said that they felt more confident and resilient as a result of their involvement.

Flood plans were the main focus of work with local businesses. Apart from Blackburn with Darwen and Calderdale, most pathfinders had a disappointing response from businesses. In the pathfinders where business flood plans have been developed, there is a need to establish how these can be maintained over time as plans will only be valuable while they are 'active', in the sense that staff are aware of them and they are used or tested.

Access to funding for local flood resilience measures

Four pathfinders helped flood groups to access funding for their work:

- Calderdale supported two groups to apply successfully for £1,000 each from the Community Foundation for Calderdale.
- Slough and West Sussex provided grants to flood groups from their own resources. Slough gave funding for two groups. West Sussex provided funding for 129 groups

in the first year and then set up Operation Watershed Active Communities Fund to enable groups to apply for different levels of funding for different kinds of activities.

- Rochdale obtained funding from the Regional Flood and Coastal Committee to pay for flood surveys and assessments. It also provided local authority funding for some activities.

The West Sussex pathfinder funding allowed flood groups to apply for basic maintenance funding to cover costs like hiring rooms for meetings. This kind of initial support may be critical to enable groups to get up and running.

Calderdale also worked with the local Credit Union to find ways of enabling individuals who would not be able to get a commercial loan to be able to obtain funding for property-level protection.

Five pathfinders provided advice and information about how to access funding. This was mainly targeted at flood groups. Northamptonshire has made the information available for anyone to access as part of its online toolkit.

Challenges and learning: What didn't work?

Promoting access to affordable insurance

Promoting access to and take up of insurance was one of the least successful strands of activity across the pathfinders. A number of projects that had intended to work on insurance decided not to carry out all the planned activities in this area (e.g. Chesham and Liverpool). The main reason was the existence of concurrent negotiations between the Government and the insurers to put in place a new national mechanism to ensure that insurance for residents in places at risk of flooding remains available and affordable (Flood Re). The pathfinder activities on insurance were mainly directed at promoting the value of community resilience approaches to local insurance companies in order to achieve agreement on favourable treatment and better premiums for properties participating in community resilience schemes. However, it soon became clear that few local insurance companies were willing to engage in discussions before details of the national agreement were worked out.

Most pathfinder projects, even the more established and experienced ones like Cornwall and West Sussex, found it difficult to find other ways of addressing flood insurance once the difficulties of engaging with insurance companies had become clear. In the case of Calderdale, insurance had been identified as an important area for improvement in terms of community flood resilience. Most of the small businesses that made insurance claims following flooding in 2012 were subsequently unable to get flood cover. However, the pathfinder struggled to engage with insurers to discuss the issue. A local insurance broker suggested that this was because most flood insurance is dealt with solely by on-line applications.

The Warwickshire pathfinder realised that there was a delicate balance to be maintained between giving insurance companies information about the flood resilience measures undertaken at community level, in order to demonstrate the increase in community resilience, and drawing their attention to flood vulnerabilities in the area which might lead them to revise their risk assessments and increase premiums. This issue stems from the lack of transparency about the information that insurers draw on to make their assessments:

> *'We've got modelling in Brook to look at the effect of flooding under blockage scenarios, e.g. in a culvert - the extent of the flooding really in that case. [I am] concerned about publicising it if it's not what the insurers already use as [I don't] want to worsen the situation. If they use a flood zone to look at what the flooding is and it comes up with something that they weren't aware of before then people won't be happy.'* (Interviewee 12PM)

Promoting the flood resilience of local businesses

Many pathfinders who worked with businesses acknowledged their disappointment at the slow progress of this strand of work. Working with local companies is a difficult area for local authorities because they have multiple roles in relation to business: for example, they regulate business activities and apply rates as well as providing information and business support. Several of the pathfinders that worked with local businesses used intermediaries as a way of building relations with this sector:

- Two pathfinders (Blackburn with Darwen and Rochdale) used a charity (Groundwork or Newground, its successor in the Northwest) to make the first contact with businesses or to lead on engagement with this sector overall.

- Two pathfinders drew on relations with local business organisations (the Chesham Chamber of Commerce and the Liverpool business forum) to help build trust in the sector.

Generally, pathfinders found it difficult to involve small businesses because of the multiple pressures on managers' time. In Cornwall, a number of small businesses were flooded during the winter of 2013–14. However, these businesses were unwilling to take action when summer came because of the high profile of the tourist season and the need to make the most of this period. Big businesses, such as supermarkets, were not interested in engaging because decisions about emergency planning are generally taken at a central level. In all, over 60 businesses were offered support to complete flood plans but none took up the offer. Similar responses were received from businesses in Calderdale and Rochdale.

There is also still a question about how the focus on forward planning and preparation can be made relevant to small companies that may feel their main challenge is to keep the business afloat at all.

'… Lots of businesses have been visited, encouraged to do a flood plan and received info. In the end, many are small, renting and transient. Therefore in terms of what they can do with structural interventions is limited.' (Interviewee 1PM)

Box 10.2 Calderdale case study: Financial and Household Resilience with Credit Union Loan Finance

Focus

This case study explores the issues relating to the cost of carrying out flood resilience works and how it can be made more affordable for residents through a credit union repayment loan. It focuses on the case of a private owner-occupier living in a property on the banks of the River Calder in Hebden Bridge who was assisted through the Household Resilience strand.

Activity

109 proprieties were surveyed, following which a 'Home Flood Safety Check' report was issued looking at flooding history, future risk levels and identifying potential flood mitigation works to either minimise the water ingress (flood doors) or reduce the impact of flooding (moving electric meters). The cost of the works was offset through small grants and if the resident was eligible, through credit union loan finance. One resident was prepared to fund the cost of the works and was happy to spread the repayments through an interest free credit union loan.

What were the objectives and how were they met?

The objectives were to empower individuals to gain a greater understanding of flood risk and preparedness and to enhance financial resilience. It was necessary therefore to ensure that flood mitigation works were affordable for lower income clients who might not be able to access traditional forms of finance. The resident involved had a one-to-one consultation and affordability checks were carried out. A referral was then made to the Credit Union which completed a more detailed application in accordance with Consumer Credit Agreement Act requirements. In this case a 44-month repayment term was approved.

What were the outputs and outcomes?

An owner occupier living in a high risk property between the canal and River Calder in Hebden Bridge had a property flood survey carried out.

Client: Mr X, retired, 74 years old, sole occupant for over 10 years

Property type: Stone end through terraced property with attic room, built 1906

Cavity: Yes, with brick inner leaf

Dates of work: January 2014 – May 2014

Mr X had already carried out some PLP work to his home which included raising the plug sockets on the ground floor, tiling the ground floors and fitting flood gates to the front and rear doors. Additional work was identified, which included polyurethane foam for the cavity wall to form a waterproofed barrier as flood water from the river had previously entered the property through its walls. Insulation of an attic room was also included in the works: whilst this had no impact on flood resilience, it did bring subsidy towards the overall cost of the work through energy company funding.

Lessons learnt

The local Credit Union provides affordable finance for lower income clients who cannot access loans through high street banks. It also means that the capital for the work is recycled back into the Credit Union and can be used to help others in similar need. Moreover, it provides residents with a good understanding of payback periods and can build financial resilience.

In this particular case, the client understood the level of flood risk and was motivated to act to try and reduce the amount of water ingress in the event of future flooding and make his home easier to clean, dry out and repair.

There were two main challenges. Firstly, although almost 75% of households acknowledged that it was their responsibility to protect their home against flooding, the take up of the works and the interest free credit union loans to spread the cost was very low. A variety of explanations were given by residents when they declined the loan offer:

- PLP to their homes not seen as a priority.
- Lack of savings or perceived insufficient income to service the loan repayment.
- Other priorities or choices on expenditure for owners who may be on low incomes or without savings to fall back on.
- Pride, especially from older residents who didn't believe in borrowing money.

- Apparent belief that protecting their home from floods was not their responsibility in around 14% of respondents.

Secondly, despite on-going informal training and support through discussion in the office and staff supervision (one-to-one) meetings, it was observed that the local authority staff working on the project may not have had the required level of negotiation skills and influence to explain the features and benefits of the work and the interest-free finance.

Conclusions

The best time to promote and carry out flood resilience and property protection work is immediately after flood events when the level and perception of risk is high. Protection measures must also be designed into insurance repair work rather than insurance being used to replace items on a 'as was' or like for like basis.

Credit Union loans offer excellent low cost, affordable finance helping owners to spread the cost of the work. However, anecdotal evidence suggests that despite targeting properties known to be in high risk areas, some owners did not believe that the level of risk and frequency of flood events was high enough to justify carrying out any recommended works.

In addition, Credit Union loans are not suitable for residents on the lowest incomes. Households in receipt of means tested benefits are not able to access such loans. Equity based loans secured against the property by a land charge could be an alternative. Unfortunately, this type of loan can tie up loan capital for an indefinite period of time until there is a transfer in ownership of the property.

Key messages

- **The pathfinders have developed approaches and tools for promoting practical flood resilience measures to local businesses** which other LLFAs can draw on in carrying out their duty under the Civil Contingencies Act to provide advice on business continuity management.

- **Intermediary organisations can be more successful in finding ways of working with local businesses** that are often small, unstable and preoccupied with issues of business survival.

- **Accessing funding is essential to enable flood groups to take proactive measures to promote local flood resilience**. Local authorities should explore what funding opportunities are available and with local flood groups to help them access funding.

11. Building Communities' Capacity for Resilience to Flood Risk: Institutional Resilience

Key findings

- Building institutional resilience was a direct objective of activities for all 13 pathfinder projects.
- Across the pathfinders 57 new flood groups were established both in areas where there had been no flood group as well as in areas where there were existing flood groups. The range in the number of groups between pathfinders largely reflects geographical scale together with existing community capital.
- Formal relationships between local authorities and flood groups have been established in three pathfinder projects (Warwickshire, West Sussex, Cornwall). Informal relationships have been established in another four whilst in five of the pathfinders those relationships have not clearly been established.
- Eight pathfinders held multi-agency meetings. Two have developed networks of flood groups, and two more pathfinders are developing similar networks.
- Flood volunteers carry out a range of activities: the development of knowledge and learning is a key contribution to building personal and institutional resilience capacities.
- Cornwall and Northampton have developed flood volunteer training packages and a total of 452 volunteers have been trained from Cornwall, Devon and Northampton.
- 11 pathfinders have worked with schools, developed materials and delivered talks. One junior flood action group has been set up (Swindon); and one play been developed (Liverpool). Rain gauges have been installed in 15 schools in Northampton.

What is meant by institutional resilience?

Institutional resilience focuses on the development of institutions, both formal and informal to support improved flood risk management. It includes both new institutions: e.g. flood group, flood group networks, as well as activities that help to build resilience within and between existing institutions e.g. multi-agency meetings, community flood plans, resilience groups within Parish councils. Broadly, it refers to the governance of flood risk management. The concept of governance considers the institutions, bodies or organisations involved in decision-making processes to consist of more than just 'government'. It may consist of a wider range of formal and informal bodies. The broader literature on governance, from the social sciences, recognises that initiative and decision

making processes do not take place exclusively at the state level but within an increasingly pluralistic structure of agents at different spatial scales. According to the concept of governance, actors do not consist of exclusively government bodies but may include private sector business, community organisations, voluntary sector bodies and other NGOs, as well as influential individuals. The concept of multilevel governance suggests that governance takes place through processes and institutions operating at a variety of geographical scales including a range of actors with different levels of authority (Hooghe and Marks, 2003).

Pathfinders focussed considerable effort to develop and enhance informal institutions and community voice in flood risk management as well as developing links between those informal institutions and formal institutions of government at the local level. In this section we also report on working with schools. As well as building community capital as reported earlier in this report, this type of work has the potential to build aspects of institutional resilience: developing links and knowledge between citizens and authorities involved in flood risk management facilitated by the school environment, together with increasing the resilience per se of educational institutions.

Reflecting on the baseline and Interim Report

Key points from the baseline

In terms of measuring outcomes of developing institutional resilience, five indicators were chosen at the community level[29]. Data were obtained on three, showing a range in terms of numbers signed up to receive flood warnings, few flood wardens in place apart from in Cornwall and six pathfinders with previous flood experience. In addition, there were 55 existing flood groups (with 30 in Cornwall).

Box 11.1: Indicators of institutional resilience capacities – Baseline situation

IR3 - % population signed up for Environment Agency Flood Warnings Direct (FWD) (% is of those who could be signed up to FWD).

Rationale: a measure of flood preparedness awareness and actions and shows engagement with authorities– Across the pathfinders this ranged from between 49.1% (Chesham) through to 87.9% (Swindon). A complete outlier was that of Slough were only 2% of those that could receive warnings were signed up for them.

IR4 – Numbers of flood wardens in area of influence.

Rationale: a measure of flood preparedness and of links between community and authorities: Five pathfinders provided data on this: in Cornwall it was reported that there were approximately 150 ‘active’ flood wardens in the area, including untrained wardens. The Northamptonshire Pathfinder reported that there were 23 wardens across the county. The Chesham, Slough and Swindon Pathfinder areas had no flood wardens before the Pathfinder scheme began.

IR5 – Previous disaster experience.

Rationale: Previous flood experience means that links and structures are likely to have been made between citizens and authorities and so should improve preparedness but is affected by the amount of flood damage and response to the last flood – nine pathfinders reported on this indicator with six having experienced floods affecting over 100 properties in their areas of influence since 2005: Cornwall, Devon, Rochdale, Swindon, Warwickshire and West Sussex.

[29] See Section 3 for details of indicators

Pathfinders reported on how many flood groups were in existence at the beginning of the programme. Overall there were 55 flood groups, with 30 in Cornwall, 11 in Devon, 8 in Warwickshire and 3 in West Sussex.

With respect to the household survey data[30] the key findings at the baseline stage are presented in the box below[31].

Box 11.2: Key findings on institutional resilience – Baseline stage

Key points on institutional resilience at the household level - baseline

- The majority of respondents in Southampton and West Sussex had attended meetings related to flooding but low levels of engagement with flooding were reported by the Chesham, Devon and Rochdale pathfinders.
- An overwhelming majority of respondents in six pathfinders had not received any advice or support from any source about flood risk and how best to prepare for a flood in the last 12 months.
- Of the seven pathfinders that asked householders if they had signed up for flood warnings, the Southampton and Warwickshire pathfinders found that a large proportion of respondents had already signed up to the service. In the other five pathfinders (Chesham, Cornwall, Devon, Slough and Swindon) the majority of respondents had not signed up for flood warnings. (Note: this differs from the Environment Agency findings because the sample is different from the Environment Agency sample).
- Over one-third of respondents in the six pathfinders where the question was asked, agreed that they had responsibility for protecting their home from flooding, with 80% agreeing in Slough. However, in Liverpool and Rochdale the majority of respondents disagreed.
- A large proportion of respondents in nine of the pathfinders saw local government as having a responsibility for managing flood risk in their local area, with a slightly smaller proportion in eight pathfinders believing that the Environment Agency has responsibility. A number of other actors such as water companies were also identified as having responsibilities

At the baseline, a patchy picture of institutional resilience can be discerned, with no clear picture emerging across the pathfinders. In terms of informal institutions (e.g. flood groups) the majority of pathfinders had none at the outset of the project. A similar picture is found for flood wardens. Sign-up for FWD was also variable. There were no indicators or questions around engagement with schools, therefore there is no data related to that. In term of networks, the Cornwall Community Flood Forum had been set up, but no networks of groups were seen in other pathfinders.

Key points from the interim report

At the end of year 1 of the pathfinders these were the highlights:

Box 11.3: Year 1 highlights for institutional resilience capacities

Flood wardens

Cornwall had developed training modules for flood wardens and trained 57 wardens in the county and supported the training of 43 wardens out of the county.

[30] See Annex 7: Household Survey Questions for details of Institutional Resilience questions together with relevant Attitude questions

[31] It should be noted that where a pathfinder is not mentioned it is because there was no data collected on that question by that pathfinder

Flood groups

Flood groups had been started or maintained by ten pathfinders, with an estimate of 53 groups in some stage of development; from having held their first few meetings (e.g. in Slough) through to being fully up and running (e.g. West Sussex). The flood groups ranged in nature and origin: in Southampton a residents working group was set up with the idea that this would develop into a flood group the following year, and in Liverpool members of the residents association have played key roles in the flood group and multi-agency meetings. The role of the National Flood Forum (NFF) was central to setting up of the groups in a number of pathfinders. In West Sussex, 14 groups had been set up, whilst they had received funding through another funding stream their development has been catalysed by the pathfinder through having an NFF community engagement officer who worked with those groups.

Flood plans

For many pathfinders, development of community flood plans was a goal of their flood group and so it was not expected as an output in Year 1. Calderdale had community flood plans in place for two of its three areas but these groups were already in existence prior to the Pathfinder scheme. In Swindon, one flood action group had started developing their plan. In Rochdale, one business had helped to create a flood action plan as part of the pathfinder. Blackburn with Darwen had a work package targeting businesses and 245 were contacted with flood plan templates. As a result, 33 businesses signed up to warning services and three took up advice for bespoke flood plans.

Engaging with specific institutions

Whilst this does cross into community capital, evidence suggests that engaging through institutions builds up their resilience. This includes engagement with schools, scout groups, landowners, etc. In terms of outputs, three pathfinders reported developing materials for engagement with schools (Rochdale, Warwickshire, and Liverpool) and carried out workshops / school assemblies. Calderdale had 15 classes planned for autumn 2014 on water and land use in schools. Other pathfinders had been into schools (including Slough, Swindon, and Blackburn with Darwen) but it was less clear what the outputs are at this stage.

Outcomes in this category, such as people being more aware of flooding, signing up for FWD, knowing what to do in the flood and actively engaging with managing their flood risk alongside authorities, were not yet being seen clearly. However, in Liverpool, members of the flood action group had developed a '*forensic knowledge about drainage*' (project manager, learning event two) and their actions led to United Utilities taking action. Southampton saw the benefit of the increased working together of the community during the February 2014 floods when residents helped to warn each other and make properties flood resistant.

Overall, work in Year 1 focussed on developing or maintaining informal structures (e.g. community flood group, flood wardens) and to some extent processes (e.g. flood planning) that could support effective behaviour in a flood through increased preparedness, networks, and awareness of what actions need to be taken at what stage. The focus was on activities and outputs with less information on outcomes, many of which were expected to be realised in Year 2 or within a flood situation. In the following sections we reflect on how far expected outcomes in Year 1 came to fruition or not alongside activities, outputs and outcomes in Year 2.

To what extent was building institutional resilience a goal for pathfinders?

Across the pathfinders, eight of the project managers stated that they were explicitly focussed on institutional resilience. As noted in Table 11.1 it can be seen that all of the projects carried out some activities that related to institutional resilience. Table 11.1 shows the activities along with the intended outputs, outcomes and impacts. The next section takes some of those key activities and considers how far and in what ways the pathfinders achieved those outputs, outcomes and impacts and what that means in terms of overall increase in institutional resilience.

Table 11.1 Outputs, outcomes and impacts associated with the pathfinder project activities listed

Activity	Output	Outcomes	Impacts	No. of pathfind-er projects carrying out activity
Development of community flood group	Number of flood groups; terms of reference for flood action group/ways of working documents	Flood planning, awareness raising, support for PLP, increased bonds of trust between communities and formal institutions responsible for flooding; multi-agency meetings	Residents engaged with managing flood risk; Increased voice of community heard by local authorities; communities able to cope better during a flood	13
Development of networks of groups	Number of networks, numbers of groups involved; terms of reference/ways of working document	Sharing learning, representation on formal structures	Embedding of community voice within flood risk management structures	2
Development of community flood plans	Community flood plan template; number of community flood plans completed; number of 'dry runs' completed	Increased organisation during a flood; residents know who to contact; vulnerable people helped	Flood damage avoided; Increased peace of mind for residents at risk; reduced risk of physical health impacts; improved recovery	12
Development of community or local authority flood 'toolkit'	Number of toolkits distributed	Increased awareness of flood risk and ability of community members to act effectively during a flood	Flood damage avoided; Increased peace of mind for residents at risk; reduced physical health impacts avoided; improved recovery	10
Engagement with local land	Number of meetings carried out; guidance for	Awareness of holistic nature of flooding and land management;	Increased holistic approaches to FRM;	9

Activity	Output	Outcomes	Impacts	No. of pathfinder projects carrying out activity
managers to develop holistic approaches to FRM	local land managers	change in practices towards holistic approaches	flood damages avoided	
Encouragement of riparian owners to maintain waterways	Number of meetings carried out; guidance for local land managers	Awareness of actions and change in behaviour of riparian owners	Waterways maintained; flood risk reduced	8
Activities with children e.g. schools	Number of activities carried out; materials for use in activities	Flood risk awareness raised of children; change in behaviours	Future generations increased awareness of flooding and actions to prepare and prevent	11
Establishing flood warden / volunteer / champion	Number of flood wardens/volunteers established	Improved communication during flooding; key link between authorities and communities; flood vulnerable people known; increased expertise during flood	Flood damage avoided; Increased peace of mind for residents at risk; reduced physical health impacts; improved recovery support for emergency services	13
Developing/delivering flood warden training	Training materials, number of wardens trained	Improved expertise and support during a flood	Flood damage avoided; Increased peace of mind for residents at risk; reduced physical health impacts; recovery support for emergency services	3
Establishing a Flood watch	Number of flood watches established	Improved information before a flood, improved assessment of flood impact	Flood damage avoided; Increased peace of mind for residents at risk; reduced physical health impacts; recovery support for emergency services	9
Establishing a junior flood group	Number of groups established	Increased awareness of flood risk	Future generations increased awareness of flooding and actions to prepare and prevent	3

To what extent have pathfinders succeeded in building institutional resilience in their communities?

As can be seen from Table 6.2, the pathfinder projects all succeeded in carrying out activities designed to build institutional resilience in their communities. Having flood groups increased linkages between councils and other stakeholders and communities; developing flood plans and establishing flood volunteers should increase the institutional capacity through knowledge and actions to reduce flood risk and cope with flooding events.

This section examines a number of those activities in terms of outputs, successful outcomes and challenges.

Flood groups

Developing flood groups was a core activity for the pathfinders. Box 11.4 provides the definition of a flood group.

Box 11.4: Definition of a flood group (used in the activities checklist but may also be called 'community flood group' or 'flood action group')

Membership of a flood group is anything from two active neighbours to a formal organisation but at least some of the members live in the local area and are focussed on the following activities:

- Taking practical action in the locality to contribute to reduce flood risk – members of the group are visibly doing things
- Taking action to benefit neighbours/wider community, not just themselves
- Developing knowledge about local flood risk and its management
- Coordinating with agencies or organisations that may be relevant to reducing flood risk.

Numbers of groups

Table 11.2 presents the number of flood groups, new and maintained in Year 1 and Year 2, and whether or not pathfinders intended to create flood groups. There is considerable variation in the numbers of flood groups existing across the pathfinder scheme as a whole and the following section discusses the factors contributing to that variation.

Table 11.2: Numbers of flood groups

Pathfinder	Stated aim to create	Groups in existence at the start of the project	New groups established in Year 1	Total number of groups at the end of Year 1 (new and maintained)	Total number of groups at the end of Year 2 (new and maintained)
Blackburn with Darwen	Y	0	0	0	5
Calderdale	N	3	0	3	3
Chesham	Y	0	1	1	1
Cornwall	Y	30 [a]	0 [a]	30 [a]	30 [a]
Devon	N	11	12	17	24
Liverpool	N	0	1	1	1
Northamptonshire	N	0	0	0	11 [b]
Rochdale	Y	0	0	0	1
Slough	Y	0	1	1	3
Southampton	Y	0	1	1	1
Swindon	Y	0	3	3	3
Warwickshire	Y	8	4	12	13
West Sussex	Y	3	11	14	14
TOTAL	**Y = 9** **N = 4**	**55**	**34**	**83**	**111** **(57 new)**

[a] Assumed no change: Cornwall has not focused on creating flood groups. Cornwall's Year 1 Project Report stated: '*The CCFF membership at the outset of pathfinder stood at 65*' but both groups and individuals can be part of the CCFF. Further clarification required on the breakdown of members but as their initial Project Plan states that CCFF membership includes 30 parish/town councils, this figure is used.

[b] Northamptonshire pathfinder focussed on training flood wardens initially across their 15 communities but did also set up 11 community flood forums although there is little detail on them.

Eight of the pathfinder projects have developed between one and five groups over the time of the pathfinder. Firstly, there are those pathfinders (Liverpool, Southampton, Chesham) where the area of influence was always very local, which made setting up one group most appropriate. Secondly, there are those pathfinders (Swindon, Slough, Blackburn with Darwen) for whom community engagement was more challenging than anticipated, making it a longer process to bring people together in groups than anticipated.

> *'… setting up the Flood Action Groups has gone well, mainly through XX perseverance with door to door visits and attendance at community meetings to promote the pathfinder project'.* (Interview 1PM)

Thirdly, Rochdale, knew that engaging their community would be more challenging due to low levels of existing relationships between members of the community and local authorities. Therefore, they recognised that developing a flood group would need to be underpinned by community development work. Finally, Calderdale did not aim to increase the numbers of their flood groups, rather the focus was on their maintenance.

Considering those pathfinders with more than five flood groups at the end of the pathfinder project (Devon, West Sussex, Warwickshire, Northamptonshire, Cornwall) all but Northamptonshire had some flood groups or community level activity prior to the pathfinder, giving something to build on. In the case of West Sussex, there was another source of support and funding in the form of Operation Watershed which was launched after the floods in summer 2012. The NFF worked on recovery with West Sussex as well in that period and many of those communities then went on to develop flood groups gaining funds from the Operation Watershed grant. In Warwickshire, six groups had already been set up by the NFF and/or the Environment Agency. In Devon there were 11 groups at the outset of the pathfinder, which again, provided a base to work with. In Cornwall, the Cornwall Community Flood Forum had emerged from the 2010 floods and brought together flood groups, with organisations and individuals focussed on flood risk management. This provided a good base which has then been further developed and strengthened in Year 2, specifically via the flood volunteer training package and the community resilience toolkit. Northamptonshire differs in that there were no flood groups in place before the pathfinder project and through their focus on community engagement and flood warden training there are now 11 community flood forums established.

Overall, the pathfinders all achieved, and in some cases exceeded, the numbers of flood groups that they set out to develop. The range in the number of groups largely reflects geographical scale together with existing community capital. The types and activities of these groups are discussed in the next section.

Types of flood groups: their development and structures

Overall, the flood groups developed in ways that fitted the context in which they were situated. In terms of approach to community engagement, section 8 highlights the different approaches taken by pathfinders to engaging communities generally and specifically in developing flood groups. Successful approaches included:

- Starting where the community were (e.g. with residents groups, or from a flooding incident)
- Being flexible and responsive (e.g. able to change if one approach was not working)
- Putting in considerable effort in terms of building one to one relationships.

Groups vary in the formality of their structures, with some being formally constituted and others meeting on a more informal basis.

Relationship with formal structures

A key aspect in relation to institutional resilience is to understand how links between the formal and informal institutions are becoming part of the formal structures of decision making. What can be observed is the extent to which the flood groups are more or less embedded within formal structures of decision making. Evidence suggests that having a clear role within wider decision making should improve the resilience of the flood groups and their relationships with institutions.

In some pathfinders like Slough and Southampton, the groups do not have formal links with the local authorities (e.g. they do not sit on council committees).

For some pathfinders' flood groups, whilst not having a formalised role with respect to flood risk management at the end of Year 2 they are considered by the project managers to be quite embedded within the flood risk management governance. Evidence of this can be seen in comments on the increased communications between local residents and the local authorities, together with an increased confidence and knowledge on the part of the residents to be able to contribute to the debate:

> *'What this has done is deepen the relationships. I wouldn't say enhanced, but given them more gravitas, because they've been given information and information is power. They've absorbed [information and experience from meetings], and I think that will make them stronger people in the future … they won't be reluctant, they won't feel they're at the end of the line.'* (Interview with a local councillor, Liverpool pathfinder Year 2 Evaluation Report)

For Calderdale there is an aspiration for the group to become part of the Local Flood Risk Management Strategy (LFRMS):

> *'One Hebden Bridge representative said "we are becoming more involved with the community, we are achieving things and becoming more established". Such empowered flood groups can act as a platform to lead local communities as part of the Local Flood Risk Management Strategy.'* (Calderdale pathfinder Year 2 Evaluation Report)

Warwickshire have also reported how the input from the flood groups has been taken through into the LFRMS.

With respect to 'embedded' this refers to those groups for whom a place is being developed within the decision making process. Examples of this were West Sussex and Cornwall.

In West Sussex, the aim was to get representation from community groups onto the County Council's strategic flood risk management group. To do this, representatives have been chosen from the WSFAGF (West Sussex Flood Action Group Forum) which brings together all the flood groups into a network. This enables representation of local communities on the decision making group within the county.

In Cornwall the Cornwall Community Flood Forum has a clear role as the place where all interested parties can come together and through that communication and relationship building it is hoped to improve flood risk management processes. Warwickshire is working towards a similar model as that of West Sussex, and Devon is looking to develop a similar type of forum to that of the CCFF.

Flood volunteers

All pathfinders worked with volunteers ranging from those carrying out manual work e.g. leaf litter clearing through to more formal Flood Wardens, and all members of flood groups were volunteers. Box 11.5 provides the definition used in the activities checklist for the evaluation which comes from the Environment Agency's recent project on flood volunteering (O'Brien *et al*, 2015).

Box 11.5: Flood Volunteer – definition used in the activities checklist

Flood volunteers take action to reduce the risk of flooding in the community or to reduce the impacts of flood events and/or develop and maintain skills (e.g. through training) in some of the following ways:

Knowledge focused: encompassing activities such as surveying a river in a catchment walkover, checking river gauges, monitoring water quality, pollution monitoring, collecting data as part of a citizen science project

Campaign focused: for example raising awareness of flooding, taking part in flood planning, educational work with schools, and promoting the uptake of local flood warden services

Physical focused: such as embankment building, habitat management, opening and closing sea gates, clearing drainage ditches and water courses

Virtual focused: such as remote monitoring or web-related action such as documenting the groups' activities and providing information on web pages.

Types of flood volunteering

Volunteering is defined as, 'an activity that involves spending time, unpaid, doing something that aims to benefit the environment or individuals or groups other than (or in addition to) close relatives' (Home Office, 2005). As well as volunteers working in flood groups, volunteers also came together to carry out ad hoc activities. In terms of the types of activities carried out, the predominant focus across the pathfinders was 'campaign focused', with all pathfinders carrying out some aspect of this. Key activities of the flood volunteers across pathfinders in this category were:

- Developing flood plans: e.g. Southampton's flood group which also planned a 'dry run' to test it out;
- Improving flood warning: e.g. Cornwall's use of telemetry in one community to provide alerts during periods of high intensity rainfall;
- Raising awareness of flooding across communities: e.g. Swindon's group running a flood awareness stall at local event.

There were specific pathfinders whose flood volunteers also focussed on knowledge gathering activities, for example: Cornwall's rain gauge at St Blazey; Warwickshire groups'

use of CCTV to enable reporting of watercourse blockages; Blackburn with Darwen's 'gully watch' group; and Rochdale's scout gully and river watch project. These knowledge gathering activities were closely linked to the campaign focused activities: for example, volunteers gathering data from, a rain gauge linking into providing a flood warning.

A number of pathfinders have had volunteers carrying out 'physical focused' activities: Cornwall's leaf litter clearing project; Calderdale's river stewardship events to remove Himalayan balsam; Rochdale's cleanup day.

The worth of continually engaging with these diverse groups may be evidenced by the cleanup day held in March 2015 in which the support was enlisted with 42 volunteers from a range of groups including the Rochdale Environmental Action Group (R.E.A.G), Duke of Edinburgh participants, and the Rochdale Council of Mosques. The Environment Agency estimated that approx. 2.5 tonnes of rubbish was collected from the morning session (Rochdale final evaluation report).

Pathfinders whose volunteering had a virtual focus included Calderdale's website http://eyeoncalderdale.com/ which is a single source of information from the authorities dealing with flood risk but includes crowd-sourced mapping of flood related problems (e.g. gully blockages).

Development of flood volunteer training packages

Cornwall and Northampton pathfinders developed and delivered flood warden/volunteer training packages. Cornwall's Community Resilience Toolkit has six modules available (see box for details) delivered during a number of training sessions to volunteers both in Cornwall and Devon. Northamptonshire has also developed training for flood wardens and a handbook to accompany the training which is also presented in Box 11.6.

Box 11.6: Cornwall and Northamptonshire flood warden training

Cornwall Community Resilience Toolkit: Training modules available

Role profile: Outlines simple ways in which a community volunteer can support their community and the Emergency Services before, during and after a flood

Flood risk awareness: Aims to help individuals carry out their role as a community volunteer in a safe and responsible way. It covers: *Assessing risk, The dangers of flood water, Personal safety, Flooding and road safety, Managing sensitive information and data protection*

Understanding flood risk: *An introduction to the processes and terminology associated with flooding, Factors that can influence flooding, Flood risk and flood frequency, Limitations of flood warnings, Managing flood risks: who is responsible? Private land owners and riparian law*

Northamptonshire County Council's flood warden handbook

Part 1: What Flood Wardens need to know

1. How does surface water flooding happen?
2. The role of a Flood Warden
3. Surface water warnings
4. Land drainage and flood risk
5. Other factors contributing to flood risk
6. Flood reporting and investigations

Part 2: What Flood Wardens need to do

a. Health and Safety
b. Insurance
c. A note about dealing with the public
d. Personal details – looking after data safely
e. Personal emergency plans

The use of sandbags: *5 myths about sandbags!, Their advantages and limitations, How to handle, store and dispose of sandbags, Alternative ways to prepare property for flooding* **Personal protective equipment (PPE):** *Highlights the importance of the correct use, maintenance and storage of personal protective equipment (PPE) such as: high visibility clothing, safety whistles etc.* **An introduction to emergency response for community volunteers:** *An introduction to the processes and terminology associated with emergency response. It also covers: Phases of a major incident, Things to consider when reporting an incident, Emergency responders: What they do and don't do, Cordons, evacuations and the media*	f. Before a flood g. During a flood h. After a flood i. Ongoing responsibilities Part 3: Reference materials a. Fact sheets published b NCC b. NCC Initial letter for Watercourses and Ditches for use by Town and Parish Councils c. NCC second letter for Watercourses and Ditches for use by Town and Parish Councils d. Personal Emergency Plan template e. Community Flood Plan f. Safety information

Whilst all the pathfinders worked with volunteers, three focused their efforts on the training and development of those volunteers. Cornwall developed its toolkit and associated training which has been used to train 300 volunteers in Cornwall, and 109 in Devon.

> *'Our Community Resilience Toolkit© and the associated training is designed to support any community that wishes to set up a flood group utilising a volunteer workforce. It can support Lead Local Flood Authorities in promoting resilience at a strategic level and provide Parish and Town Councils with the ability to set up groups within their municipal area.*' (Cornwall pathfinder Year 2 Evaluation Report)

The Northamptonshire pathfinder has also developed a toolkit and trained 43 wardens (there were three in their 15 targeted communities before the pathfinder).

> *'A key focus of the pathfinder project was the recruitment of flood wardens, as well flood warden training and support, and it is almost certain that this substantial increase in flood wardens can be attributed to the project.'* (Northamptonshire pathfinder Year 2 Evaluation Report, CAG)

The focus for the warden is on helping people to be prepared for flooding and 'can bring the community together during difficult times' (Northamptonshire Flood Toolkit on how to become a flood warden).

Successful outcomes of flood groups and flood volunteers

The anticipated outcomes for the flood groups and flood volunteers included:

1. Capacity building of both volunteers and staff in local authorities, agencies in terms of:

- **Knowledge and awareness of flood risk management**

  Increased knowledge of flood risk management: a key aspect of the flood groups was how far the members have developed their knowledge and awareness

of flooding. The main outcome of campaign type volunteering was to increase knowledge of flood warnings and responses, to increase positive actions that could be taken in the event of a flood, to ensure there are plans that can be followed during a flood to reduce negative impacts for communities and specifically to support more vulnerable members of the community during a flood. Knowledge gathering activities support taking early action to prevent flooding in some cases as well as providing data over time on rainfall and other issues.

Learning by institutions and members: a key aspect in relation to institutional resilience is that of the learning that has happened by both the groups and the institutions. There is evidence that this has happened across a number of pathfinders by all parties:

'*As demonstrated by one of the flood action group's feeding their local knowledge into the modelling used in Swindon's local flood risk management strategy and Thames Water's Catchment Study in Swindon.'* (Swindon pathfinder Year 2 Evaluation Report)

'*When asked 'what they had learned' a few key responses were as follows: 'More about the way flood management works at county level' (Shipston and Alcester and Bidford workshop); 'Authority structures, organisations and actions' (Shipston and Alcester and Bidford workshop); 'Details of various agencies, project information, pilot projects, how the systems work together' (Nuneaton and Bedworth workshop).'* (Warwickshire pathfinder Year 2 Evaluation Report)

- **Confidence and voice of citizens to engage with key authorities**

Having increased knowledge enabled members to engage with Agencies and local authorities and this gave them confidence to take part in those conversations and in so doing provided a voice for the community:

'It gives us a voice because the Flood Forum [ ] is set up to get all interested parties together to talk to each other. And it's not them and us, sort of thing. It's trying to work together as a partnership to solve a problem.' (Flood group member quoted in Swindon pathfinder Year 2 Evaluation Report)

- **Increased bonds of trust between local community members and institutions:**

Through regular engagement with agencies and authorities relationships and trust is being developed:

'Communication between agencies is warmer and better (reduced jargon) despite residents not thinking so. Relationship with [water company] has improved in the 'blame game' and their understanding of the communities. They were really committed to the project.' (Interview 8PM)

'*At first many communities expressed their frustration on how complex flood risk management responsibilities and governance are locally. However, groups*

noticed that by regularly engaging with local authorities and agencies staff, two-way communications have improved and relationships have strengthened with the local community.' (Devon pathfinder Year 2 Evaluation Report)

- **Support between community members to improve flood resilience**

  A key outcome of flood groups is the support it gives in communities to people to improve flood resilience.

  Support for property level protection: having a flood group has helped in a number of pathfinders to support the uptake of PLP. In Southampton specifically, the flood group really came together around PLP and procured it as a group with support from the local authority. The project manager for Southampton did not think the solution would have been as successful without the group.

  Flood groups helping people to avoid damages in a flood: crucially, with specific respect to impacts, is whether the flood groups can help people avoid damages within a flood. Southampton had a clear example of the flood group helping during the flood, by warning neighbours and moving cars as needed.

Box 11.7 : Southampton pathfinder case study: Establishing a flood action group (with no or limited community led catalyst)

Focus of case study

In certain locations, particularly urban settings, there can be a lack of a community led catalyst to bring individuals together to develop a community response to managing flooding. Rather than the traditional route where a local community establishes themselves as a flood action group to try to progress actions to manage the risk, the project worked on progressing the actions first, then encouraged the community to establish a flood action group.

What did you do?

Leafleting to raise awareness for a first meeting of residents, organised by project partners, to begin a local community discussion, and action, relating to flood risk. Door-knocking, accompanied by local residents, to raise awareness and interest in the flood group. Newsletters were circulated throughout the St Denys area, to keep residents informed about the Belsize Flood Project and opportunities to join a flood group. 340 copies of the newsletter were distributed to households in St Denys. St Denys Community Flood Fair and associated publication materials, which as well as Information and adverts for Flood Action Group meetings published on the community-run website 'itchentides.org.uk'. Regular meetings for those residents receiving PLP and flood wall, increasing in frequency towards critical stages in decision making. These residents, who made the majority of the flood action group, wished to focus on the PLP for the short term. Once PLP and flood wall implementation was planned, the focus shifted back to a community-wide approach in addressing local concerns about flood risk, with action driven by residents. Meetings were organised with residents only, with support from the National Flood Forum, and their wish to develop a 'St Denys Flood Resilience Plan' was proceeded with.

What were the objectives and how were they met?

To improve community flood resilience locally was a particularly important for the legacy of the project. An established flood action group supports and empowers local people to be a representative voice for their community, by working in partnership with Agencies and Authorities whose work involves flood risk. Through this 'grass-root' group, the local community members are able to:

- address their concerns over malfunctioning assets/and other issues
- be constantly in touch with what is intended for their community

- know procedures that are already in place regards routine maintenance
- have a voice as to the future flood risk of their community through consultation.
- instigate 'flood watchers'
- create awareness of flood risk to the wider community
- prepare to reduce the impact on the community should a flood event occur, including Flood Resilience Plans

What were the outputs and outcomes?

Local residents established the St Denys Flood Action Group, and became formally affiliated with the National Flood Forum. The St Denys Flood Action Group embarked on developing their St Denys Flood Resilience Plan, in preparation for future flooding events, rather than taking the route usually taken by flood action groups supported by the National Flood Forum, which is a series of multi-agency meetings to address concerns over such things as or malfunctioning assets and other issues, before developing a flood resilience plan later down the line.

Community cohesion increased, many neighbours met through the project. During a flood on 14th February 2014, neighbours offered and received more support than previous flooding events, when individuals had felt isolated.

Lessons learnt

What worked well?

- Involving local residents in raising awareness and interest for the flood action group.
- Utilising previously set up resources utilised by the community as a means to raise awareness – in this instance, the 'Itchen Tides' website, produced by the CCATCH project.
- Being flexible with the project plan to allow local community's aims and wishes to be focussed upon, recognising the value and legacy of community-led action.
- Many Flood Action Group members were very committed to attending meetings.

What challenges were experienced in delivering the activity and how have these been addressed?

- Many of the flood action group members were involved in PLP and flood wall discussions as part of the Belsize flood project 'working group', where logistics and correspondence with companies were led by the council. The flood group residents wanted to focus on this activity before branching out to work independently as the St Denys Flood Action Group, however with unforeseeable setbacks to the programme of rolling out PLP, the group have had less time to be supported in establishing their community-led group.
- Residents had become used to attending working group meetings with the council, where their role was to ask questions and be informed. The translation to working as a community group driven to work independently toward their own aims and objectives therefore required more time and support than for similar groups. This was possibly also perpetuated by the groups' decision to develop their Flood Resilience Plan first, which is a very intensive process and must follow a definitive structure. The usual route of taking a group through Multi-Agency Meetings before developing Flood Resilience Plans is a very flexible, community-tailored and often cathartic process, which may better support the initial establishment of a flood action group. However, the flood action group was certain that this was the path they wanted to follow, and thus this was the best course of action for this group.

Conclusions

Given the recognition that it will take some time and effort to establish a successful flood action group, not everyone will be interested or have time to be involved, but looking for a handful of committed members who are able to be a representative voice for the community. It is recommended that several methods should be utilised to try and raise awareness to ensure optimum success. Residents have been empowered, and the community appears to be closer knit, perhaps demonstrated during 14th February 2014 flood. The effects of the St Denys Flood Resilience Plan produced by the group will need to be seen in the future, but through meetings with local staff from Authorities and Agencies, a better understanding of broader emergency planning and response, and their implications for this area, is likely to have been realised by all involved. It is

important to recognise the value of being flexible and supporting flood action groups in the way they want to be supported - each community has different needs and aims. This community chose to become established in this way, and the project has provided them with the support to do this.

2. Development of further actions to increase resilience to flooding

The flood groups once up and running carried out actions to increase resilience to flooding which are detailed here:

- **Flood planning:** 12 of the pathfinders carried out some form of community flood planning. This ranged from engaging people in developing individual flood plans through to flood groups carrying out 'dry runs' of emergency plans.

- **Multi-agency meetings:** A key objective for NFF was to get flood groups to meet with all relevant agencies, in 'multi-agency meetings'. Of the pathfinders, eight held multi-agency meetings with the aim of getting the voice of the communities heard by all those involved in flood risk management.

  'A major success of the multi-agency meetings was the knowledge sharing both from the agencies to the community and vice versa. Communities felt that they had a voice, suggesting ways in which they believed flood risk could be lowered in their areas.' (Warwickshire pathfinder Year 2 Evaluation Report)

Indeed the pressure for these meetings from the flood groups in West Sussex led to the council having to seriously consider how it would interact with the groups:

> *"There has been quite a demand on the council from flood action groups in terms of requests for meetings and involvement of drainage engineers.....In many ways it has pointed to the need for the forum [WSFAGF] ..so that the Local Authority has one place to meet all the groups.....The relationship between the flood action groups and the council had to be ironed out and that took some time"* (Interview 13PM)

Other pathfinder projects held meetings or had forums with the different agencies which showed the awareness and importance given to engaging with formal institutions of flood risk management.

- **Flood groups raising awareness:** in a number of pathfinders the flood groups worked with local authorities to raise awareness (e.g. Calderdale, Swindon). This included giving talks and also running stands at events. The value of local input was recognized, having local people talking about flooding rather than just the agencies and authorities was seen as a benefit.

- **Initiative taking:** having a voice and confidence was shown in the way that some of the flood groups took the initiative and were beginning to develop separately from the pathfinder project. For example, in Chesham the group changed the priorities:

'The project had initially planned for CFLAG [Chesham flood action group] to create an emergency flood plan and subsequently take part in a flood response training exercise. However, CFLAG felt they would rather concentrate on improving infrastructure and its flood resilience as a priority, and the group was supported further in achieving their own aims. The value of community-led action and Flood Action Group empowerment as a key pathfinder project objective was thus recognised.' (Chesham pathfinder Year 2 Evaluation Report)

In West Sussex, flood groups were able to gain funding for a wide range of actions:

'Flood Action Groups have collectively obtained £305,469.55 from a variety of sources for local flood alleviation schemes/projects, community emergency kits, flood action group development, training.' (West Sussex Evaluation report YR2)

Challenges for flood groups and flood volunteers

The key challenges for flood groups in terms of being able to sustain their role in improving institutional resilience included:

- **Sustaining interest, knowledge and skills within the community:** a key issue has been that flood groups often rely on a small number of people to make things happen. It was recognised that this can be quite a fragile structure, with careful consideration needed about what can be expected from members:

  'However, it is also clear that this is a fragile resilience built on several layers of trust and ultimately reliant on a small number of key individuals..' (Cornwall pathfinder Year 2 Evaluation Report)

  'Although the members/champions are extremely dedicated and committed and do a variety of work including some manual work including some litter clearance, it was decided due to their age (most of the group are retired) and as some would be pre-occupied with their own properties, we would limit their responsibilities in regards to helping other residents during an event.' (Liverpool pathfinder Year 2 Evaluation Report

  Having project managers and community engagement specialists involved in the pathfinder projects has been crucial to creating interest and maintaining momentum over the period of the project and their role cannot be underestimated.

- **Developing clear communications and support:** within a flood group there may well be different views on what the group wants to achieve and how it will engage with authorities. Time is needed for groups to form and establish relationships internally and externally with other organisations. This quote provides some suggestions as to some of these issues:

'The flood groups comprise mainly of retired, but busy community volunteers. The development of such groups takes considerable time and support. We have had moments of miscommunication that nearly led to the resignation of all flood group members from one group; we have seen conflicts in groups and a number of flood group members left since they wanted to find solutions to identified flooding problems i.e. pursue lobbying around dredging as opposed to other members who were happy to concentrate on resilience; and various members have been dogged by illness and personal tragedies. However, we still have three flood groups in place. Clear guidelines and effective and regular communication from both Calderdale Council and the Environment Agency has helped support the flood groups including several workshops to help the groups consider their purpose and priorities' (Calderdale pathfinder, Year 2 Evaluation Report)

- **Maintaining links with formal institutions:** across the pathfinders a continuum of approaches to the maintenance of links was discernible from 'hoped for' through to 'clearly planned for'. For example:

  'Multi-agency groups meetings may continue if the local flood groups want them but it's likely there will be fewer. Contacts have been passed on to flood groups, and can be used if a meeting is wanted. The flood groups will also be able to link into the NFF for support. [XX] has an awareness of the groups and it is assumed he will use them as needed and provide a point of contact within the council if the flood group wants it. But the flood groups have been designed to be as self-sustaining as possible.' (Interviewee 9PM)

  Across the pathfinders, as far as can be discerned, five clearly fitted into the 'hoped for' category, with another four who, because they were well developed as groups and had good relations with their institutions, were more likely to maintain their links. This latter four also tended to only have between one to three groups which enables the links to be more easily maintained. The other four were more towards the 'clearly planned for' category, with two having developed networks of groups (West Sussex, Warwickshire), one having developed a forum (Cornwall). Devon was aiming for a similar forum to that of Cornwall, but was at an earlier stage.

- **Understanding needs of volunteers**: In Swindon the pathfinder moved away from the community flood champion idea as it did not seem to be working. People said they valued being in a group more, felt it had more impact and also did not like being singled out as a lone 'champion'. This again demonstrates that different approaches worked in different contexts.

  This was echoed by a comment in Cornwall's final report:

  'The common factor [for wanting to be a flood warden] is a desire to support ones community. The reasoning for this can be centred on personal self-interest or a wider community conscience. Also, for many, being a flood volunteer (even the

term 'Warden' can prove contentious) is about being there to help 'in the event' and the prospect of too much training time and a formal qualification proved a disincentive.' (Cornwall pathfinder, Final Report)

- **Time, skills and commitment needed:** All pathfinders who facilitated the setting up of flood groups commented on the time and commitment needed by skilled community engagement staff, as well as committed members of the community. In areas without previous flood experience and low levels of community capital this was heightened, as the example from Swindon illustrates (Box 8.2).

Networks

Outputs

As well as flood groups as new institutional structures, a number of pathfinders had the aim to develop networks for knowledge sharing and support and to build a stronger platform from which to engage with authorities.

Two distinct types of networks were found among the pathfinders:

- A network of Parish/Town councils, flood groups, individuals, representatives of stakeholder organisations: Cornwall Community Flood Forum (CCFF) was an example of this.

- A network of flood action groups: West Sussex Flood Action Group Forum (WSFAGF) was an example of this, and this type of network was part of the NFF approach to engaging those at flood risk in local flood risk management.

The CCFF was in existence at the outset of the pathfinder project and one of the objectives of the project was to develop it further. Its membership comprises parish/town councils, standalone flood groups and individuals with relevant knowledge of flood risk management, along with representatives from stakeholder organisations such as Cornwall Council, The Environment Agency and South West Water. In addition to this target 'membership' audience the CCFF '*is a flourishing resource for all residents of Cornwall who wish to understand flood risk and resilience'* (Cornwall evaluation report YR2)

The stated aims of the forum was:

'The Cornwall Community Flood Forum has an interest in all flood related activities within Cornwall. We are guided in particular by the following aims:

- *Support communities in becoming better prepared*

- *Raise flood awareness within Cornwall*

- *Promote partnership approach to flood risk management and community engagement'* (CCFF website)

It has a constitution, website and Facebook page. It was formally constituted as an association and at the end of the project had one part time member of staff hosted by Cornwall Rural Community Charity.

The WSFAGF was developed through the life of the pathfinder project and its membership is solely local flood action groups. Using the NFF model of grassroots engagement, the forum brought together flood action groups from across West Sussex to share good practice and to create a network of support for flood affected areas. At the end of the project it did not have any formal presence in terms of websites etc.

The WSFAGF differs from the CCFF in that its main focus was on the flood action groups and empowering local people to be engaged in flood risk management, often people who have not been involved in local governance structures before. The CCFF whilst also having that element has a slightly different emphasis in that it also included elected members and representatives of stakeholder organisations enabling networks and partnerships to develop. Whilst the CCFF was clearly a resource for its members, it was not clear how the CCFF fits into the formal governance of flood risk management in the county. Since it has become a separate constituted entity from the council, it will be interesting to see if it moves towards having a more formal role in relation to flood risk management in the way that the WSFAGF does. Specifically, the WSFAGF engages with the flood risk management governance in West Sussex by having two members on the strategic flood risk management board for the county.

Through the pathfinder project, both West Sussex and Cornwall now have new institutional structures as part of the flood risk management landscape representing a wide range of interests, and more specifically, the voice of those affected by and at risk of flooding.

Warwickshire pathfinder had a similar plan for a network to West Sussex and Devon was working on a model similar to that of Cornwall.

Successful outcomes for networks

For those involved in the networks a key success has been around the networking and linking between different groups of people involved with flood risk management.

> *'But the biggest thing that developed networks etc was bringing all the groups together that has really built resilience as people have shared ideas, examples. So bringing the group together across the county was a really big thing and developed networks.'* (Interview 13PM)

> *'Cross sector working is what the Cornwall Community Flood Forum is about, bringing everyone together.'* (Interview 4PM)

> *'A key success for CCFF was in becoming an independent charitable organisation, separate from the county council thereby enhancing its existing role as "independent, an honest broker".'* (Interview 4PM)

For West Sussex, two related successes were the appointing of members of the WSFAGF to the strategic flood risk management board and the broader institutional change within the council to recognise the value of community voice.

> *'There has been a real governance change, with members of the flood action group sitting on the Strategic Flood Risk Management group alongside the Risk Management Authorities – this has been a huge institutional change – to recognise the value of the community voice.'* (Interview 13PM)

Challenges for networks

The challenges for the networks that have been set up will be in sustaining momentum over time. West Sussex and Cornwall pathfinders have put in place structures to aid that sustainability: the integration of the forum in the Strategic Flood Risk Management board in West Sussex and the setting up of the CCFF as a separate organisation.

Box 11.8 West Sussex case study: Integration of the communities into flood risk management

Focus of case study

Following on from the recovery programme initiated from the 2012 flooding in West Sussex and supported in continuity within the Pathfinder project, 14 Flood Action Groups have been developed in communities across the county. In recognition of the growing network of Flood Action Groups across West Sussex, issues were identified relating to:

1. The sustainability of these groups beyond the conclusion of the project;
2. How can the Flood Action Groups be most effectively supported by the Risk Management Authorities considering the limited resources available for Flood Action Group multi-agency meetings;
3. How the network of Flood Action Groups could be further supported to shape and influence strategic flood risk management priorities and to implement effective solutions. In response to the above challenges, the West Sussex Flood Action Group Forum (WSFAGF) was established.
4. This is composed of one or two representatives from each of the Flood Action Groups. Two candidates were then nominated from the WSFAGF to represent the Flood Action Groups on the West Sussex Strategic Flood Risk Management Board (WSSFRMB), marking a significant change to the governance structure of Flood Risk Management and the incorporation of the local communities.

What were the objectives?

The primary objectives in changing the governance structure of Flood Risk Management in West Sussex to include community representatives were to:

1. To encourage the establishment of the WSFAGF to ensure help towards Flood Action Group sustainability and provide peer support as a form of exit strategy within the pathfinder project;
2. To provide transparency of how Risk Management Authorities manage flood risk in West Sussex and to provide communities with the opportunities to contribute to the process of FRM.

Setting up of the West Sussex Flood Action Group Forum

The Flood Action Group event held in January 2015 provided an opportunity to promote and launch the future engagement of the network through the innovative WSFAGF. Posters, leaflets and briefing documents were produced by the NFF to ensure that the Flood Action Groups were aware of the initiative and to provide any further details on the purpose of the WSFAGF. Furthermore, the NFF Community Officer attended a number of Flood Action Group meetings to provide presentations to, and discuss this with, groups that requested further details.

This event composed of an open public event (including presentations from West Sussex County Council and National Flood Forum; and a networking opportunity) which was then followed by a closed, inaugural meeting for the Flood Action Groups representatives. This meeting provided the opportunity to discuss the Terms of Reference (ToR), membership and structure of the WSFAGF.

Following the inaugural meeting, the elected temporary chair supported, by the National Flood Forum,

arranged the first official meeting of the WSFAGF members on the 19th February, 2015. The agenda for this meeting was designed to allow each Flood Action Group 5 – 10 minutes to discuss who they are; what they have done as a group; their key flooding issues; and what they would like out of WSFAGF. The group members were thus able to identify commonalities and priorities which would then be discussed by the two elected WSFAGF representatives at the WSSFRMB, which was to be held on 26th February 2015.

Integration of the WSFAGF into the WSSFRMB:

The WSSFRMB is director level partnership of the flood risk management authorities which provides strategic overview and decision making around flood risk management work within the county. It also signs off the work programme across the county which is the foundation for the Local Flood Risk Management Strategy.

It was agreed that there would be one permanent WSFAGF representative to sit on the WSSFRMB accompanied by a second rotated representative. This would ensure consistency in delivery of the issued identified within the WSFAGF through the permanent representative and allowing any specific issues to be addressed by the rotating member.

The first meeting WSSFRMB with community representation was held on 26th February 2015.

"We think these new arrangements are a very positive start to the involvement of Flood Groups at a strategic level" Jane Smeaton, West Felpham Flood Action Assembly

What were the outputs and outcomes?

Output: Establishment of the West Sussex Flood Action Group Forum and integration into Flood risk Management governance structure in West Sussex.

Outcome: This will mainstream community involvement in flood risk management at a strategic level.

- Promote effective communication and collaborative working between Flood Action Groups to ensure that ideas, information, and experiences can be shared between communities.
- Provide clarity on the roles and responsibilities of the Risk Management Authorities
- Ensure that Flood Action Groups are informed on the set Local Strategy for Flood Risk Management discussed within the SFRMS.
- Ensure that communities are involved alongside other key players in discussions about flood risk management
- Maximise opportunities to influence partner strategies and resource allocation and to maximise external funding Promote effective engagement with potential stakeholders

Lessons learnt

What worked well?

- Identifying commonalities and shared issues between FAGs
- Sharing best practice and ideas on how to tackle common key issues

What challenges were experienced in delivering the activity and how have these been addressed?

- Additional commitment for the community members – extra meeting etc – had to counteract that to quarterly meetings. Rotating chair and host
- Additional funding from council
- Support from NFF and WSCC Community Development Team to help chair the first year of meetings. Concerns that issues at the local level would not be addressed and instead – transitional arrangements in the process of being agreed.

Conclusions

The incorporation of members from the local community within the WSSFRMB has both been bolstered by, and has itself bolstered, the strength of the network and relationships between the Flood Action Groups across West Sussex. This has been enabled through the various opportunities provided for these groups to meet and share knowledge and experiences.

The inclusion of community members on the WSSFRMB has, based on the first meeting, been a success and has had the support of not only the group members but also the current members of the board and of West Sussex County Council Leads. This is a pilot project and will need to be monitored in the long term before any final conclusions can be made, but a progressive and confident start has been made by the board members and, in particular, by the Flood Action Group representatives.

The role of key personnel

All of the pathfinders had project managers which meant that there was one person responsible for the delivery of the project. In twelve of the pathfinders the project manager was from the local authority. For one of the pathfinders the project manager was a contractor brought in by the council, an approach that was taken for quite a few services in that authority. Alongside the project managers, for eight of the pathfinders there were NFF members of staff who focussed on the community engagement and development of flood groups. Over the period of the project there were staff changes in eight of the pathfinders largely in terms of the local authority staff but also in terms of the NFF staff. For example, the NFF were brought in to work in Slough in YR2. However, even with the staff changes having a project manager meant that there was someone committed to driving through the actions on the projects. What was noticeable about the staff engaged on pathfinder was their commitment and belief in what their project was trying to do. The NFF staff in particular bought an energy and expertise to the project which was commented on by a number of project managers as being a key factor in the success of their projects.

> *'NFF have really helped and have come into their own in YR2. YR1 was focussed on community engagement more widely and YR2 focussed on the setting up of the flood action group and getting them to do their community flood plan. Their expertise has been invaluable….. not sure they [the LA] would have been able to do it because they don't have the expertise and also the NFF are independent. So really glad that they have had the benefit of the NFF and it has really come out in YR2.'* (Interview 10PM)

A key learning point is the importance of personnel with the right skills to carry out the project together with good committed project managers who want to see the project succeed.

Working with children and young people

Flood groups, volunteers and networks all focus on adults, with the various aims of creating structures and processes to bring citizens and local authority and agency staff together to increase knowledge and develop practical ways of improving flood resilience. Work with schools to reach children and young people has the potential to develop links with authorities and agencies through education and contact (e.g. school assemblies etc.) as well as increasing their knowledge of flood risk management as a whole.

11 of the pathfinder projects carried out work with children and young people predominantly through schools. Those activities that provided educational content on flooding and river management had the potential to enable children and young people to know who the key authorities are and how the flood risk management cycle works. In a couple of pathfinder projects, focus moved beyond awareness raising to engagement activities, specifically with the theatre work in Liverpool; the junior flood action group in Swindon and the Scouts in Rochdale.

In terms of outputs, the pathfinders have developed materials for a wide range of educational audiences represent a considerable resource going forward for other initiatives to draw upon. In terms of the evaluation of those materials, however, more evidence could be collected on what works in which specific situations. In Liverpool a play was developed by children and students from Liverpool John Moores University. It was performed by 3rd year drama degree university students and delivered to local schools, with elements feeding back into drama tuition and training.

> *'The play I thought was really powerful, really well-delivered, really well-scripted, and very much at the children's interest level and obviously, locality interest as well. It was a good length for the children, a fast pace, fast moving, I couldn't fault it at all. The documentary … I thought was fantastic, I learnt a lot from it and I think the Years 5 & 6 particularly were very interested.'* (Headmaster, Liverpool pathfinder Year 2 Evaluation Report)

Understanding the longer term impacts of these types of activities would be very useful.

Table 11.3. Pathfinder project activities with children and young people

Pathfinder project	Raising awareness activities	Engagement activities	No. of schools/ children involved
Blackburn with Darwen	Flooding sessions.		10 primary schools and 1 High school (438 children in total).
Chesham	FloodSmart – A History of Flooding in Chesham video screening. Flood-themed assemblies.		Shown to over 400 school children in two schools.
Calderdale	Ran classes on water and land use.		447 children at Calder High School and five primary schools.
Cornwall	Data from the rain gauge shared with local schools .		Not indicated.
Liverpool	Presenting materials to a "FAST" session "Families and Schools Together" project with local St Gregory's primary school. Flood awareness film screening.	2 workshops with the after school club at the Woodlands Community Centre. Work with Valley Theatre to creatively engage children through developing and performing interactive climate change plays.	2 primary schools and 1 secondary school.
Northamptonshire	Provided schools education pack for teachers to share with children. On-line Schools Education Pack for Year 5 students. Installed a Rain Gauge in a school to help with teaching the flood material		A rain gauge installed in a school in each of the 15 target communities.

Pathfinder project	Raising awareness activities	Engagement activities	No. of schools/ children involved
	in the Schools Education Pack.		
Rochdale	Workshops relating to flood awareness in schools.	Engaged local Scouts groups and schools to establish a Youth Flood resilience Initiative and developed a badge. Local Scout groups, schools and youth groups involved in weather watch, river watch and gully watch projects, production of a film for social media purposes, Scout Camps and school twinning with flood affected schools.	Not indicated.
Slough	Developed materials for engagement with schools.		2 schools.
Swindon	Prepared educational packages for junior flood champions.	Junior flood champions drawn from deprived areas.	1 junior flood group established (10 students aged 11-15).
Warwickshire	Ran educational activities with children, developed materials, ran activities, train teaching staff.	Install a weather station for the pupils to use as part of their school curriculum to raise awareness of flooding.	3 schools (91 pupils).
West Sussex		Supporting junior citizen events and initiatives such as Duke of Edinburgh Award and Junior Neighbourhood Watch.	Aimed to reach 10,000 youths.

Successful outcomes for working with children and young people

There have been a number of successful outcomes in this area:

- Increased knowledge and awareness of flooding for children and staff

Although pathfinders reported the numbers of children and staff engaged with across the time of the project, very few actually gained feedback on what had been learnt from the different sessions, and therefore it was hard to know how much knowledge and awareness had increased as a result of these sessions. Warwickshire pathfinder did get feedback from its sessions with 98 pupils across three schools on what they had learnt. All but two of the pupils said they had learned something about flooding ranging from:

'That Bedworth does flood' (year 8)

'Ways for communities to come together and manage their flood risk' (year 11)

'Different causes of flooding and who helps prevent it' (year 7)

'Many things but mainly around the hazards and precautions that need to be taken in the order of a flood' (year 8)

'About the jetstream and why it flooded so bad and ways to try and stop flooding" (year 7)

'All about the 2007 floods and the causes of floods' (year 7) (Warwickshire final evaluation report)

- **Children and young people as flood volunteers**

In Rochdale, the scout group carried out some gully watch activities, showing how children can be involved as flood volunteers alongside adults. In Swindon the junior flood action group was facilitated by adults, but the children decided on their own activities and in year two they chose to do assemblies to their peers, create hoodies with their logo, slogan and names on, learn first aid, and present at a Flood Exhibition. The evaluation showed improved knowledge for members of the JFAG in three key areas: flood knowledge, social skills and presentation skills (Swindon pathfinder Year 2 Evaluation Report).

Challenges for working in schools to reach children and young people

- **Clarity of objectives:** The main challenge was to ensure that information given in various educational situations (e.g. assemblies, classes etc.) has a clear objective and is clearly evaluated. The case study from Swindon provides some lessons learnt from their work creating and delivering educational resources, which highlight the need to be clear about audiences, and objectives within the desire to "educate".

- **Priorities of schools:** Working successfully in schools needs the engagement of the school and for the work to be a priority, and schools have many other priorities and therefore it is important to assess the levels of commitment to the project before working with a school.

Potential for scaling up

Given the successes and challenges in developing institutional resilience capacity it is important to consider what might be needed in order to replicate some of the findings elsewhere.

Local nature of flood groups

The work carried out by pathfinders to develop flood groups suggests that they work best at a very local level, even down to the level of one or two streets. It will be vital that those in the flood group feel connected to the actions that are being discussed and delivered and that there is some sense of shared agenda and possibly existing community capital

between those involved. This would suggest that flood groups would not work in the same way and may not have the same efficacy if covering a larger geographical scale.

Linking flood groups into wider resilience groups

For some areas it may make sense for the flood group either to become a wider general community resilience group or to affiliate to a wider community resilience group as a sub-group. Both of these would facilitate links with wider structures and may streamline engagement with local councils. On the other hand, however, it could reduce the interest of the flood group participants, having a diluting effect on their energies for flood risk management. Also, this is unlikely to work if imposed upon flood groups; rather it should be the outcome of reflection and discussion between relevant parties.

Role of facilitators and community engagement specialists (e.g. NFF and others)

A major catalyst for the increasing of numbers of flood groups in (e.g. West Sussex, Warwickshire) has been the availability of a community engagement specialist, mainly through the NFF. For further flood groups to be set up and set off in a sustainable direction expert input is a key element. The value of the national network of staff from the NFF has enabled sharing of practice across the pathfinders and provision of a wide network of support.

Building capacity of the NFF

Linked to the point above was the way in which the pathfinder built capacity of the NFF, enabling it to grow and to have a greater presence across the UK. In this sense another layer of governance is being developed along with the county wide networks of groups that represent communities who are at flood risk. This is an important step change in the governance of flood risk management in the UK.

Networks of groups

Clearly from the discussion above, the development of networks such as Cornwall Community Flood Forum and West Sussex Flood Action Group Forum is one way to scale up involvement of communities in flood risk management.

Sharing learning

Across the pathfinders there is now much capacity, experience, learning and resources which could be shared with areas that are starting to develop their community resilience to flooding. This has already happened between Cornwall and Devon with the flood volunteer training.

Challenges and learning points: What didn't work?

Overall, there clearly challenges in developing institutional resilience, the challenges of community engagement which are highlighted in section 7, together with the challenges discussed within this chapter, which are summarised here.

Flood groups and flood volunteers:

- Sustaining interest, knowledge and skills within the community
- Developing clear communications and support
- Maintaining links with formal institutions
- Understanding needs of volunteers
- Time and commitment needed

Networks:

- Sustaining momentum over time

Working with children and young people:

- Clarity of objectives
- Priorities of schools

However, all of the pathfinders made progress towards improving institutional resilience. Links have been made between communities and authorities and agencies. A key factor involved in the success of this work has been that of the project managers together with the community engagement staff from the NFF and this is discussed in the following section.

What has changed since the baseline?

There have been changes since the baseline which should improve the linking between communities and institutions and lead to improved actions before during and after a flood. A key community indicator was that of related to flood wardens. As discussed in the section above, this term has a number of meanings. While some pathfinders reported that volunteers did not want to be called "'wardens"' and others described what their volunteers do as "'not performing the role of a typical warden"', it is clear that they are providing voluntary work in flood risk management. Two clear changes were made since the baseline in relation to flood volunteers:

- All pathfinders increased the numbers of flood volunteers. As can be seen from Table 11.2, there are now approximately 111 flood groups in operation, 57 were created during the funding period.

- As important, was the beginning of a systematic approach to training flood volunteers led by Cornwall and Northamptonshire with over 400 volunteers having gone through the training during the funding period (409 via Cornwall, and 23 via Northamptonshire).

In terms of the household data, the key questions were around awareness of flooding, signing up to Environment Agency FWD, receiving flood advice, responsibility for managing flood risk. Figure.9.3 shows the percentage change from the baseline to year two (for those pathfinders who submitted data) in terms of receiving flood advice. It shows that for these pathfinders the change has been towards people having received flood advice (% agreeing has increased and % disagreeing has decreased).

In addition, Box 11.9 illustrates some positive changes in two of the pathfinders. As noted in section 4, due to limitations in the data it has not been possible to carry out further comparison of data at the scheme-level.

Box 11.9: Evidence of institutional resilience outcomes from household questionnaire

Calderdale

109 householders completed the questionnaire in 2014 and 71 repeated the questionnaire in 2015. It is important to note that these are already flood savvy communities, resultantly, 95% of householders had already found out if their home was at risk of flooding (this figure remained static (2014/2015). However, the proportion of those householders agreeing or strongly agreeing that 'better preparing your property against flooding will reduce anxiety' rose from 65% (71 of 109) in 2014 to 80% (57 of 71) in 2015.

The number of householders who prepared flood plans rose from 54% (59 of 109) to 68% (48 of 71). The proportion of householders that signed up to FWD rose from 63% (69 of 109) to 76% (54 of 71). All of which supports the outcome of householders becoming better prepared.

Cornwall

235 householders completed the questionnaire in 2014 and 187 in 2015. The majority of responders (71% in both years) had found out if their home was at risk of flooding. In terms of believing their home was at risk the % who felt their homes were definitely at risk reduced slightly between Year 1 and Year 2 going from 28% and 24%, the biggest change was the increase in people who felt their home might possibly be at risk from 17% to 52% and those who did not think they were at risk at all which went from 52% in Year 1 to 19% in Year 2. This could suggest that their awareness of flooding has been raised to the extent that they are considering flooding as a possibility for their homes.

In terms of sign up for FWD there was a very slight increase from Year 1 to Year 2 from 35% to 36% in terms of who had signed up and also an increase in for those who have thought about doing this from 13% to 17%, showing a slight increase in uptake. As to respondents saying that they know what they need to do if there was a flood warning, that increased from Year 1 to Year 2 by 9% from 58% to 67%. Those disagreeing with the statement reduced by 15% from 33% to 18% but the numbers saying they did not know increased from 9% to 15%. It may be that people had gained some knowledge but not enough to feel confident that they would know how to act if a flood warning was issued.

Thinking about institutions, and who respondents considered to be responsible for managing flood risk in their local area, the institution with the highest % was the Environment Agency both in Year 1 and Year 2 (74% and 78%). This was followed by the local council (78% and 68%) although that reduced in year 2. The third highest was 'You and your family' at 43% and 41% in Year 1 and Year 2.

Key messages

- **Communities are better able to contribute to ensuring their own resilience if they are working with local authorities**.
- **Successful flood groups have developed where time has been taken to understand the needs of the community**. It is important to recognise and build on existing capacities but not to underestimate what is involved.
- **Setting up flood groups and creating networks, for example through multi-agency meetings, has proved to be a very valuable way of linking members of the community with formal institutions**. These structures are appreciated by community members and risk managers alike.
- **Flood volunteers can be engaged in many different ways.** Don't assume that they are all the same: encouraging their involvement in different roles and areas can increase the participation of community members.

12. Building Communities' Capacity for Resilience to Flood Risk: Infrastructure Resilience

Key findings

- All the pathfinders worked on one or more areas of infrastructure resilience, with the focus depending on the priorities of the lead pathfinder organisation or local residents, as well as on the availability of resources (land and buildings as well as funding).
- The provision and management of local flood resilience infrastructure is an important focus for liaison between local flood groups and the flood authorities (for example through multi-agency meetings).
- Developing infrastructure resilience proved to be time-consuming as issues of ownership and long-term management had to be agreed in each location. However, there was also a benefit in dealing with each location and case individually, as the process generally engendered a high level of ownership from local communities.
- Local authority procurement processes are inflexible and present a significant challenge to local authorities' ability to implement community infrastructure initiatives. The pathfinders found ways of overcoming these constraints.

What is meant by infrastructure resilience?

The European Commission defines critical infrastructure as 'an asset or part thereof… which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people' (EC, 2008: Article 2a, quoted in Bach *et al.*, 2013: 1).

For this evaluation, infrastructure resilience looks at community and individual flood infrastructure. Individual infrastructure includes the type of housing together with any physical actions people might have taken to increase their household's resilience to flooding. Community flood infrastructure was a focus for a number of pathfinders, which carried out activities to create infrastructure such as places to store basic equipment for use in flood events (such as high-visibility jackets and sandbags or other material for creating temporary barriers) or maintained and improved infrastructure such as drains.

The infrastructure resilience measures taken by one or more pathfinders were:

- Drainage – repair, maintenance, installation of screens (to prevent blockages) and CCTV

- Catchment management and sustainable drainage projects to enhance the capacity for land to absorb excess water
- Rain gauges
- Flood stores[32]
- Measures to improve homes (including flood gates, air bricks, non-return valves, pumps, etc.) which are referred to as PLP
- Flood defences.

The Cornwall pathfinder mentioned that it had (unsuccessfully) asked the Environment Agency to improve flood defences in one area. This type of liaison with flood infrastructure providers could contribute to infrastructure resilience but in this report would be considered as part of institutional resilience.

To what extent was building infrastructure resilience a goal for pathfinders?

As shown in Table 12.1, while only five of the pathfinder projects specifically mention infrastructure resilience within their aims and objectives, all pathfinders, have carried out some activities to enhance infrastructure.

Table 12.1: Institutional resilience activities by pathfinder

Pathfinder	Infrastructure resilience activity
Blackburn with Darwen	Drainage
Calderdale	Flood stores, PLP, catchment management
Chesham	Drainage
Cornwall	Rain gauges, maintenance of drainage, catchment management
Devon	Rain gauges, maintenance of drainage, PLP, flood stores
Liverpool	Tree planting, PLP
Northamptonshire	Rain gauges, household PLP surveys, flood stores
Rochdale	Drainage, PLP, catchment management
Slough	Drainage and culverts, PLP
Southampton	PLP, flood defence
Swindon	Drainage
Warwickshire	Drainage and culverts, CCTV, rain gauges
West Sussex	PLP

[32] Flood stores are included both as an Institutional and an Infrastructure Resilience measure.

Why were these activities undertaken?

Infrastructure is generally the first thing that communities want to make them feel protected from flooding. In some cases, the infrastructure improvement takes the form of a physical change or even a barrier that people can see and that gives them greater confidence that there are measures in place to stop the flooding. The Chesham project manager commented that while the local council felt that the main flood infrastructure was in place, the local action group in Chesham continued to make investment in drainage information and infrastructure their main priority.

Property level protection (PLP)

PLP measures to adapt individual properties to be less susceptible to flooding by preventing water getting in or reducing the damage caused by flood water (for example by moving electricity meters out of basements in Calderdale) were included in nine of the pathfinder projects. Some measures can be described as 'fit and forget' (e.g. having mechanisms like permanent flood gates or non-return valves fitted), because they don't require the property owner to do anything differently. Other measures may have to be put in place when there is a flood warning.

Drainage

Local authorities in their capacity as highways authorities have responsibility for drainage as well as, if they are LLFAs. Local communities are often very aware that blockages of drains and culverts can create a flood risk and this area has been one of the main focuses when communities engage with risk management authorities. The focus of the community infrastructure improvements carried out by the pathfinders is local and seeks to encourage collaboration between the flood authorities and the community. As a result, a number of pathfinders have worked on drainage issues. In the Blackburn with Darwen pathfinder, for example, actions to clear drains were generally carried out in response to residents' requests from responsive flood groups and used as a means of building relations and establishing trust within the community.

Where drain and culvert maintenance was recognised as an issue by flood groups and this has led to the development of mechanisms for improving regular monitoring and maintenance, these arrangements allowed measures to be taken proactively and problems avoided. Collaboration between local residents or flood groups and the authorities in identifying where actual or potential drain blockages existed and the actions needed led to creative measures such as the installation of trash screens and CCTV cameras (Warwickshire) or the training of ex-offenders to clear leaf litter to avoid blockages. Multi-agency meetings provided a forum in which local groups raised issues of drainage maintenance with the relevant authorities. In many pathfinders, this resulted in action that reduces the risk of future flooding.

Promotion of catchment management and river stewardship

The Calderdale and Rochdale pathfinders took measures to promote catchment management and river stewardship, through the involvement of schools and community volunteers in learning and action (Calderdale) or by incorporating stewardship activities into an existing growing project (Rochdale).

This kind of action was a positive way of increasing resilience rather than focusing on the resistance of built infrastructure. In both pathfinders the activities included a significant element of learning and capacity building. This means that future action can be more flexible and responsive to change; it also promotes adaptation to changing climate pressures.

Rain gauges

Rain gauges were a popular infrastructure resilience measure in areas where there were no flood warnings (e.g. Cornwall, Devon) or where surface water rather than river flooding was the main risk (e.g. Northamptonshire, Warwickshire). The existence of simple, relatively cheap technologies for collecting rainwater and providing data to local people made this an attractive option for pathfinder action. For the rain gauges to provide an effective system of information and flood warning, they need to be maintained and there needs to be a system in place whereby the data generated is processed, the level of risk is assessed and where action is required, the information is passed on to residents and others who need it.

These requirements imply that rain gauges need to be part of a social infrastructure which connects the data produced with someone who has the capacity to translate it into meaningful and actionable information for local people. Subsequently, there needs to be a channel for the information to be taken to the people who need it, such as vulnerable people who need to contact families, carers or the authorities. Flood groups or flood wardens may often be the links between the information itself and the at risk community; mechanisms need to be in place to ensure this happens, particularly given that the time between receiving the warning and the onset of flooding may be extremely short.

Flood stores

Flood stores put equipment for managing a flood event within the community and the responsibility for distributing and using the equipment lies with the local group. This was particularly important in areas where there was a risk that the emergency services may not be able to arrive quickly (e.g. Liverpool and Northamptonshire) or where flooding was rapid (Calderdale and Devon).

Flood defences

The Southampton pathfinder installed temporary flood barriers to limit the possible flood flow routes to properties on Adelaide Road. This made it possible to reduce the risk of flooding to a number of properties which could not be covered by PLP measures because of the lack of meaningful engagement with the residents.

How were the activities undertaken?

Flood infrastructure has traditionally been an area of action for engineers and professionals, from which lay people were excluded. Many of the approaches to infrastructure resilience developed by the pathfinder challenged that distinction between expert and lay knowledge (and action) bringing the two perspectives together so that technical solutions can be informed by local knowledge and local people get a better understanding of the level of protection offered by different measures.

The existence of flood groups or active local organisations (e.g. parish councils in Northamptonshire) was essential to this new approach to developing and strengthening individual and community flood infrastructure by:

- Organising and channelling lay knowledge to the technical structures (within the local authority, the Environment Agency, local water companies or private contractors) to inform the design or assessment of solutions;
- Mobilising volunteers or community resources to implement some actions (e.g. catchment management or clearing ditches);
- Communications with members of the community to explain actions and motivate participation.

Most of the measures require ongoing monitoring, maintenance and care. Where these are PLP measures, this responsibility must be assumed by the home-owner. As stated by this interviewee:

> *'Trying to convey to homeowners that they need to maintain the pumps and other PLP measures in order to keep resilient and safe, and to continue to keep aware of maintenance aspect is a learning issue. Successful take up as went on the back of Green Deal surveys and flooding was a part of it.'* (Interviewee 8PM)

In some cases, the measures provided additional benefits to individuals or the community and these were an important 'selling point' and a factor in their uptake. Some examples that were promoted locally were:

- The energy efficiency benefits of PLP measures: flood doors are better insulators than standard doors, for example. The Calderdale pathfinder was able to help a resident access funding under an energy efficiency grant scheme to contribute towards the cost of PLP measures. In future, Calderdale Council is intending to move responsibility for property level flood resilience to its building works department so that these synergies can be maximised. Liverpool used the energy efficiency benefits of PLP and the associated reduction in energy bills as an argument to encourage take up.
- The use in schools of the data produced by rain gauges for learning activities.

Box 12.1: Rochdale pathfinder case study: Green Deal incorporating Flood Resilience Measures. Whole House Climate Resilience Pilot Study.

The pathfinder has sought to achieve innovative approaches and lever additional resources or opportunities for delivering increased flood resilience. The Green Deal energy efficiency grant programme had identified two pathfinder areas, Wardleworth and Heywood, as part of its targeted areas for promoting take up of grant in Rochdale borough. There was a clear relationship between the Green Deal targeting and areas of vulnerability to flooding and an opportunity to link flood risk assessments with Green Deal assessments, which would help to ensure that PLP measures and flood resilient specifications for Green Deal measures could be brought together in a single local programme.

Focus of case study

The focus of the study was to provide flood resilience surveys for a minimum of 30 properties. Subject to agreement from householders, the Council expects to deliver more than 30 surveys and the additional properties will be funded through the local authority. The surveys were intended to provide a property report setting out:

- Flood risk and appropriate resilience measures which will include specification for Green Deal products (to ensure maximum resilience to flood water and minimise the need for replacement wherever possible
- House maintenance priorities where attention is needed to minimise exposure to flood damage
- PLP measures as appropriate.

The communities of Wardleworth and central Heywood are, in addition to being at significant risk of , priority neighbourhoods containing targeted house types for the Green Deal programme seeking to deliver home energy efficiency measures. The communities are also characterised by having harder to reach households in respect of flood risk awareness and preparedness and low incomes, hence affordability of measures can be a disincentive to house improvement and increasing property resilience to climate.

What did you do?

Consultation was primarily with local landlords (private and social), tenants and individual householders to achieve engagement with the project, as well as with other key stakeholders including the Regional Flood and Coastal Committee and the National Flood Forum.

What were the objectives and how were they met?

The objectives were to:

- Achieve local flood risk management priorities as set out in the Local Flood Risk Management Strategy for Rochdale Borough, especially supporting vulnerable communities in areas of multiple deprivation and providing affordable and sustainable approaches to property level flood resilience and house maintenance.
- Increase community and household resilience objectives as set out in the North West Regional Flood and Coastal Committee 2020 Vision for communities at risk.
- Achieve the Greater Manchester Climate Strategy and objectives for community based climate resilience.

The project was also intended to identify future potential demonstration blocks and properties to help disseminate and encourage roll out of key ideas and good practice.

What were the outputs and outcomes?

35 properties receive surveys to potentially increase their resilience.

If these properties get PLP and Green Deal measures, the key expected outcomes will be:

- Increased property level flood and climatic resilience in communities of significant risk.
- Delivery of resilient investment through the Green Deal programme in Greater Manchester (GM) supporting strategic GM energy efficiency and climate resilience priorities.
- Greater levels of flood awareness, preparedness and ability to recover effectively and affordably from flooding in vulnerable, hard to reach, low income communities.
- Improved damage avoidance and protection of public investment in climate resilience delivered through AGMA, Defra, DECC and local authority funding.
- Innovative approaches to identifying funding and support for flood resilience in low income households.
- Good practice which can be rolled out within Greater Manchester and the North West and demonstrable innovation linking key DECC and Defra investment priorities for vulnerable at risk

communities.

- Delivery of local flood risk management priorities as set out in the local FRMS and resilience objectives as set out in the NWRFCC 2020 Vision.

Lessons learnt

What worked well?

- Combining two projects to successfully to deliver work that would otherwise be unavailable to the most vulnerable households in the area.

What challenges were experienced in delivering the activity and how have these been addressed?

- Trying to engage and ensure complete "rows" or "blocks" of terraced or semi-detached houses signed up to the scheme to fully create the benefits of flood resilience and energy saving methods for the targeted properties.

Conclusions

This was an opportunity to demonstrate new approaches to whole house climate resilience investment in hard to reach, deprived and vulnerable communities where innovative partnership and funding approaches may unlock significant householder and community scale flood resilience benefits. It was also a unique opportunity to test new approaches and potentially influence future roll out and integration of climate resilience investment in a more cost effective way.

Reflecting on the Baseline and Interim Report

Key points from the baseline

The most common infrastructure resilience measure has been the installation of property-level protection (PLP). Other infrastructure resilience measures vary, reflecting the different geographical and physical characteristics of the pathfinder areas, including:

- Surface water management measures / leaf litter projects
- River stewardship / upland land management
- Flood action trigger and warning systems (rainfall gauges, sirens)
- Road drainage / surveys of drainage networks

The existing levels of infrastructure resilience were explored in the baseline report, which identified three indicators of community infrastructure resilience as presented in Table 12.2.

Table 12.2: Indicators of infrastructure resilience at community level

Community resilience category	Reason for using indicator	Indicator(s)
IN1: Housing style	Temporary and mobile homes are less resilient.	% housing units that are not bungalows or mobile homes (Source: 2010 Census)
IN2: Shelter capacity	The availability of temporary accommodation makes it easier to re-house flooded people	Units of accommodation available for displaced people (Source: pathfinders)
IN3: Recovery	Evacuation centres provide a safe	Number of schools/halls as designated

Community resilience category	Reason for using indicator	Indicator(s)
	place for people to go	evacuation centres within the area of influence (Source: pathfinders)

IN1 – housing style: data was obtained from the 2011 UK Census. Across England, 0.4 per cent of dwellings are caravans or other mobile or temporary structures[33]. Across the 13 pathfinder areas there was an average of 0.46 per cent of dwellings that are caravans or mobile homes. The pathfinder areas had between 0.04 per cent (Liverpool pathfinder) to 1.66 per cent (Cornwall pathfinder) of dwellings that are caravans or mobile homes[34].

It was not possible to get information on single storey or basement accommodation (where residents cannot move themselves or their belongings out of reach of the flood water). While housing type is a census question, responses do not include information about the single storey or basement situation of housing.

IN2 – shelter: While only two of the pathfinders (Chesham and Cornwall) provided data for the Baseline Report, a further three provided data at the end of the project (Liverpool, Northamptonshire and Slough). These confirm that local authorities generally do not keep properties specifically for emergency accommodation but tend to use the bed and breakfast providers that work with Social Services. Cornwall reported that aside from individuals accommodated in private bed and breakfasts, the County Council has 10 council sponsored 'hostel' bed spaces for homeless people in Cornwall; it was not clear whether this provision would also be available or suitable for people displaced from their homes by flooding.

IN3 – evacuation centres: There was no change from the Baseline in the data on the number of evacuation centres reported by the six pathfinders that originally provided information (Chesham, Cornwall, Northamptonshire, Slough, Swindon and Warwickshire), all of which reported that there were buildings (e.g. schools, leisure centres and community centres) that had been identified as evacuation centres within the areas.

One pathfinder did report a change in this indicator: as a result of the Liverpool project, the Woodlands Community Centre had agreed to be the rest centre for the local community and this is now included in the community plan. This represents a significant improvement in provision: previously evacuees would be taken by bus to a sports centre approximately three miles from the estate.

Key points from the Interim Report

In the first year, many pathfinders found their work focused on community engagement activities, with infrastructure interventions generally developing more slowly than planned. Nevertheless, a number of pathfinders started work on infrastructure resilience measures:

[33] http://www.nomisweb.co.uk/census/2011/KS401EW/view/2092957699?cols=measures
[34] The full table of percentages of mobile homes per pathfinder is shown in Appendix 3.

- PLP surveys carried out (Southampton, Liverpool, and Calderdale) or planned (people signed up for surveys in West Sussex).

- Surveys: two pathfinders (Northamptonshire and Warwickshire) had carried out surveys of flood risk and drainage infrastructure. The Northamptonshire pathfinder delivered community risk reports for 12 of their 15 target communities. Warwickshire had highway drainage investigated and some modelling carried out to support one of the flood groups.

- In terms of infrastructure to help measure rain and to assess water levels, Northamptonshire provided a rain gauge for the Waste and Energy Discovery Centre being built in Kettering and had one fitted in a school. In Warwickshire, CCTV has been installed along a watercourse to enable residents to see water levels online and take actions accordingly.

- Cornwall set up and delivered a scheme to train 105 ex-offenders to clear leaves from drains in order to manage surface water flooding.

- Flood stores were not included in the original list of infrastructure measures, but are clearly structures supporting community resilience measures. In three pathfinders (Liverpool, Calderdale and Blackburn with Darwen) flood store locations were identified. In Blackburn with Darwen, 10 businesses were given access to a store of sandbags to help them protect their businesses.

To what extent have pathfinders succeeded in building infrastructure resilience in their communities?

Most of the pathfinders have established or strengthened flood groups. Where these groups were liaising regularly with the flood authorities (for example through multi-agency meetings), the management of local flood infrastructure was raised and discussed.

Local groups become involved in drainage maintenance and in decision-making:

> *'Full survey done by flood group to plot all drains / culverts. [These are] Checked / cleared on a regular basis. One of our members has been on a course for this purpose. Through above work of flood group, parish council now able to work with Highways and [and the local water company] on vital village drainage with more informed knowledge and experience.'* (Interviewee 5PM)

This led to numerous improvements being made:

> *'At a practical level, screens will be replaced. This is something the residents have wanted for a long-time but only the weight of the flood group gave them a voice that was heard by Thames Water.'* (Interviewee 9PM)

Rain gauges were installed by four pathfinders (Cornwall, Devon, Northamptonshire and Warwickshire). In Devon the stream level and rain gauges are part of a system that provides emergency warning calls to coordinators and flood wardens.

The ownership of the rain gauges was usually been handed over to the local group or host institution (e.g. school). While it was acknowledged that this builds ownership, it was generally been a time-consuming process.

> *'As each location is dealt with individually, this engenders high level of ownership from the community in question, but it also takes time as separate meetings are needed to site and set up each gauge. Also land ownership permission is needed which can cause further delays.'* (Interviewee 5PM)

The future costs of maintenance of rain gauges has been mentioned as a problem by a number of pathfinders and solutions had to be found to ensure that this equipment is covered by maintenance agreements at least for the first few years.

In terms of the impact on flood risk, a stakeholder commented:

> *'The support of the projects on local community rainfall monitoring and telemetry systems, to provide triggers for community level response has also proved successful. The learning from this aspect of the project has been shared within our organisation, as it shows that communities often have a range of flood risks, from rivers to surface water, which they need to respond to and which may require different triggers. These triggers could be the Environment Agency Flood Warning Service but also may be supplemented by a locally managed trigger for surface water flooding from their rain gauge.'* (Interviewee 5SH4)

Flood stores were set up in ten communities. As with the other infrastructure measures, the time taken and difficulties of negotiating the location and establishing the management of the resource should not be underestimated:

> *'It was unclear who had responsibility for the flood store so the placing of it was delayed. The community had taken account of the flood risk to the store through procedures while professionals wanted it out of the risk area. It almost resulted in the resignation of the whole group.'* (Interviewee 2PM)

PLP approaches were taken by seven pathfinders, leading to direct improvements to 161 properties. The degree to which these reduced the likely damages from future flooding varies.

These projects generally required a greater input of time and resources than originally expected:

> *'The implementation of the PLP within pathfinder was very resource intensive and required a significant investment by West Sussex County Council and the NFF. It has been successful but largely due to the tenacity of the staff involved.'* (Interviewee 13PM)

Box 12.2: Liverpool pathfinder case study: Property flood resistance measures on Woodlands Estate

Focus

The Defra Flood Resilience Community Pathfinder programme provided an opportunity to flood protect properties at risk of surface water and river flooding in a geographically isolated and deprived community. This had the benefit of protecting and supporting our most vulnerable residents as well as promoting independence and independent living as residents are better prepared to respond to events such as flooding or severe weather.

What did you do?

Oversaw the project management of the survey phase and installation stage of the scheme. This included the preparation of internal documents observing Financial Regulations and Standing Orders following established rigorous procurement and tender procedures for not only the required surveys but the awarding of the installation contract too. There was daily contact with the successful contractors. We were onsite at least two times a week and engaged with residents through drop in sessions in the Community Centre, knocking on doors, leaflet dropping and through more formalised meeting structures.

What were the objectives and how were they met?

- To carry out professional surveys of affected properties to determine the most appropriate flood resilience measures to be installed; and
- Install small scale identified resilience measures into approximately 30 affected residential properties. (These can include the installation of flood resistant doors to keep water out, non-return values in pipe work to prevent waste water from backing up through internal pipe work, installation of 'smart' air bricks which self-seal with rising water in addition to repointing and sealing gaps in brickwork which could permit water ingress).
- To encourage property resilience measures in cases where flooding occurs frequently and other flood management solutions that could not be supported on a cost benefit test.
- The surveys and installations were achieved through a rigorous tendering process that required the appointed contractors to have proven experience in this specialised field and use only market recognised products.
- The timely and almost seamless engagement with those receiving the works was realised through social capital by working closely throughout the scheme with the Woodlands Residents Association representatives. The National Flood Forum representative involvement was also central to meeting the objectives as she ensured that the community was involved and informed throughout the process from arranging flood drop in sessions to regular community meetings in the local Woodlands Community Centre.
- The key success of delivering this element of the scheme at a local level was also the willingness of a local community champion to act as a liaison point between residents and the appointed contractor.
- Community resilience was in addition strengthened by the involvement throughout the scheme of Liverpool City Council Emergency Planners.

What were the outputs and outcomes?

- 30 properties have received flood resistant measures.
- There is evidence that house insurance costs have reduced.
- That heating bills have reduced due to the thermal properties of the flood doors.
- Residents have noticed that the external noise from the road has diminished and led to less distraction.
- Pump priming the installation of flood measures means that properties are more likely to be brought back into letting standard by landlords. One long standing 'void' property that received flood resistant works has with the encouragement of the residents with the absent landlord been brought back into the lettings market.

Lessons learnt

What worked well?

- The involvement of the National Flood Forum throughout the process.
- From the inception and throughout the scheme continual meaningful engagement with the local community. It was the community that decided which houses should receive flood resistant works along the length of Netherley Brook.

- The promotion of community resilience holistically – whilst flooding was clearly the highest risk of residents that lived along the course of the river it gave the opportunity to promote wider community resilience throughout the Woodlands Estate.
- Afternoon / Evening drop in centre sessions prior to installation works to allow residents the opportunity to see samples of flood products.
- Utilising the 'Blue Pages' hosted on the NFF website to contact prospective contractors.
- A resident who was willing to be a conduit between community members and contractors for installation scheduling. And who was also – and more importantly - a known respected neighbour who offered support on an ongoing basis.
- The involvement of politicians, one in particular Councillor Kent and the local MP Maria Eagle who were champions of the scheme from the outset.

What challenges were experienced in delivering the activity and how have these been addressed?

The huge amount of paperwork associated with local authority procurement works. This was managed by perseverance and looking at good practice across the country.

Getting the engagement / consent of some owner occupiers, tenants / landlords that were suspicious of the offer. This was addressed by the reinforcement of the scheme by local residents hand in hand with personal contact with the NFF and Liverpool City Council representatives to provide reassurances.

There is no formally recognised qualification, national training or approved standard for Property-level Protection Surveyors and training and accreditation. This was overcome by ensuring that the procurement brief was tight and covered kite mark standards and was installed and overseen by an experienced and reputable company.

Conclusions

There was a general feeling on the estate of being overlooked in terms of support from public agencies in favour of other championed areas, as it is predominantly a privately owned estate. This scheme restored faith within the local community and brought a sense of working together the community harnessing its collective strength can make improvements on the estate.

The mix of the local community with the support of the NFF and working very closely with the local community was very successful – and hard to imagine a better compliment.

This is a specialised area and as we become more familiar with these types of scheme the more confident we become regarding delivery and the ability to encourage individuals to take on more responsibility.

Potential for scaling up

Many of the activities tested by the pathfinders have the potential to be scaled up and used by other local authorities. The Cornwall pathfinder leaf litter project, for example, has shown that using people undertaking community service to manage local leaf litter on highways in order to reduce surface water flood risk can be successful and this approach is easily transferable.

In some cases further work is being done as a result of the pathfinder, which will provide tools to help other local authorities develop work on infrastructure resilience. For example Liverpool has become involved in a spin-off pilot scheme with Building Research Establishment (BRE) which will lead to the development of a database of PLP measures for insurance companies which will give the companies information about the kind of resilience provided by different measures. This should help in negotiating better insurance contracts for residents with PLP measures. Rochdale is developing its work on combining Green Deal energy efficiency measures with PLP measures for deprived or vulnerable households.

Community input to discussions about drainage issues have meant that these can be taken into account and improve future decision-making. This underlines the importance of infrastructure resilience being linked to strengthening institutional resilience:

'As a result of the pathfinder project, United Utilities and Rochdale MBC planning teams are reviewing ways of working between our organisations to best manage drainage relating to future flood risk from proposed new developments.' (Interviewee 8PM)

'…through the flood group the Council and Thames Water have acted on the communities concerns. For years there had been an argument about whose responsibility so it was not resolved. The greater pressures of the group and multi-agency meetings overcame a long-held community frustration.' (Interviewee 9PM)

Challenges and learning: What didn't work?

Developing infrastructure for community resilience was associated with a number of problems:

- Procurement – local authority processes aren't set up for procuring infrastructure / equipment to be managed outside the local authority:

  'The original aim was to establish a network of community-based rain gauges throughout the county. However, two factors restricted success of this project: firstly, procurement procedures of the local authority. Secondly, in addition to the initial capital cost, rain gauge equipment also incurs an annual subscription and maintenance cost which was seen as a potential burden to local communities.' (Interviewee 4PM)

- Responsibility for ongoing costs. As the quote from Interviewee 4PM shows, there were problems in taking in actions where it was not clear who would be responsible for future maintenance costs.

- Ownership of locations where infrastructure is sited. If to be sited on private land, the process involves negotiations with private owners: this prevented a drainage project being carried out where it was intended in Chesham.

- In several pathfinders, the take up of PLP surveys was lower than expected.

Box 12.3: Cornwall pathfinder case study: Community Flood Prevention – The Leaf Litter Project

Blocked drains and leaf litter are common themes in flooding. Defra's 2007 Pitt Report identified a need to reduce the risks of floods, have a better understanding of each local authority's drainage system and ensured clear responsibility for the systems is held by the local authorities. Upon interview about the 19/11/2010 Lostwithiel flooding event, two residents felt leaf litter had played a significant role. Drain clearing, the responsibility of the Highways Authority, is expensive and labour intensive.

In 2011 Climate Vision voluntarily approached stakeholders to bring together expertise, training and manpower to create a project to remove autumn leaves covering drains and turn them into a valuable resource, in a bid to help alleviate surface water flooding from mid-September 2011 to mid-December 2011. In 2013/14 and 2014/15 Pathfinder funding enabled roll-out of the project to three sites in order to gather data and produce a report and toolkit for use in other areas from mid-October to mid- January.

What did we do?

Climate Vision designed and managed delivery of the project. Having identified drains susceptible to blockage by leaf debris during autumn, flood impacted sites were determined through community discussion and witnessing landscape response to rainfall events. Climate Vision consulted Cornwall Council's Highways Authority, Devon & Cornwall Probation Service, The Environment Agency, Lostwithiel Town Council, Par & St.Blazey Town Council and Cornwall Community Flood Forum to produce a routine drain-clearing schedule for the three communities along with a response plan to minimise the impact of extreme weather events likely to lead to flooding.

Having studied the catchment area the final schedule was based on: 1. Area of the road most likely to have drains covered in leaves 2. Ability to clear all three sites and deposit leaves to compost site in one day 3. Ease of transporting workers safely from site to site 4. Ability to respond outside of normal clearing schedule Climate Vision ensured the local media were very well engaged with the project, in line with the Pitt Report's recommendation for related public information campaigns.

What were the objectives and how were they met?

- To reduce surface water flooding events.
- To inspire and reform Community Payback Offenders
- To provide a 'toolkit' to use nationally

What were the outputs and outcomes?

In liaison with stakeholders, Climate Vision:

- identified drains susceptible to blockage by leaf debris
- produced a routine drain clearing schedule
- managed working methods to include, training, equipment and PPE
- Produced interim & final reports including evidence of improved flood resilience.

Outcomes

There has since been no surface water flooding in the areas and:

- Offenders valued their work as members of the communities thanked them
- The Highway Authority gained free and effective labour
- The Probation Trust benefitted from a highly visible work stream and reduced re-offending
- Stakeholder partnership working has successfully increased
- A 'toolkit' has been produced to ensure replication in other communities.

Lessons learnt

The media easily grasp the community thanking the offenders as a 'good news' story'. One single town councillor didn't like the leaf litter being mulched at the local allotment and it resulted in the demise of the project at an entire site.

Conclusions

The approach is worth repeating again and can be transferred to other locations. In order to ensure future sustainability, it would be important that all local councillors understand the approach and support its continuity.

Key messages

- **Infrastructure is an important part of community resilience**: having the right infrastructure makes communities better able to manage and cope with flooding while at the same time the process of developing infrastructure is key to building community capacity for flood resilience.

- **It is important to work out what is needed with all involved, to install infrastructure that a community can manage and/or create community capacity to use and maintain the 'kit',** and to be aware that procurement rules are not usually geared to this kind of process.

- **Much individual infrastructure, like property-level protection, works better as part of a community resilience process or package rather than in isolation**.

13. Calculating the Benefits of the Pathfinder Projects

Key findings

- All of the pathfinders made an assessment of the main benefits of their interventions. Eight pathfinders calculated some monetary benefits.
- Ten of the 13 pathfinder projects estimated that their projects would provide direct tangible benefits to households and businesses by reducing the risk of flood damage to property.
- Two pathfinder project teams identified intangible benefits in terms of reducing worry about future flooding and mental and physical health impacts. Given that many of the measures said to have led to these benefits were also carried out by other pathfinders, these benefits are likely to be more common than is suggested by the evidence provided.
- Several pathfinders identified unexpected benefits such as the involvement of volunteers in a range of roles, from flood wardens and flood group organisers to people participating in river restoration or catchment management activities. More work needs to be done to develop robust methodologies for calculating this kind of benefit.

This section sets out the objectives of the assessment of the benefits of the pathfinder interventions, the approach followed and the methodology used to obtain evidence of the benefits at the individual pathfinder level. We summarise the evidence provided by the pathfinder project teams and discuss what this says about the financial benefits achieved and their transferability.

Objectives of the assessment of benefits

The pathfinder scheme was intended to demonstrate the benefits of interventions that enhance community resilience. A powerful way of demonstrating change is by quantifying improvements and showing how these contribute to financial benefits, as reflected in two of the scheme's objectives:

- Enhance flood risk management and awareness in ways which *quantifiably improve* [our emphasis] the community's overall resilience to flooding.
- Demonstrably improve the community's financial resilience in relation to flooding.

Putting a monetary value on the outcomes of interventions makes it possible to compare costs and benefits and make comparisons between pathfinders and between measures. One of the aims of the evaluation was therefore:

- To investigate the economic benefits and transferability of any financial resilience measures.

The main focus of this assessment was on financial benefits, that is, it takes the standpoint of the individual or local area / economy. This means that the values reflect actual money transfer as a measure of loss – for example the market price of goods that have to be replaced as a result of flood damage – rather than values for the national economy ('economic benefits'). This was a pragmatic approach given that the assessment relies on data provided by the pathfinder project teams which reflect financial values.

The scheme evaluation team was also interested in looking at how far it might be possible to quantify the benefits of other community resilience measures, especially those promoting community capital and stronger relationships between community organisations and higher-level institutions, where methods of benefit assessment are less developed. Identifying and developing ways of quantifying the benefits of this kind of intervention would make it possible to compare community resilience interventions with more traditional engineering approaches to flood risk management.

The transferability of the benefits to other contexts and the relationship between the financial benefits and the wider economic benefit of the pathfinder scheme are addressed at the end of the chapter.

Approach to calculating benefits

The benefits of projects or interventions can be expressed in a variety of ways. In some cases a monetary measurement is feasible; in others a non-monetary measurement is more feasible and possibly more desirable. Non-monetary measurement can be on a nominal scale (e.g. trained/not trained), on an ordinal scale (e.g. rank ordered, such as: most important, important, not important) or on an interval scale (e.g. six people were trained as flood wardens).

The interim evaluation included a discussion of what kind of measurement of monetary benefits might be possible and where the focus might lie. It was agreed that the objective was not to provide a comprehensive assessment of monetary benefits across the whole scheme. This would not be possible because of the diversity of interventions being undertaken by the pathfinders, the focus on what are termed 'intangible' benefits – such as community resilience itself – and the lack of robust evidence attributing monetary values to the outcomes of many of the interventions.

The evaluation provided an opportunity to explore the evidence that was available at the local level – i.e. the level of the individual pathfinder project – that could be used to make a quantitative assessment of the interventions.

Figure 13.1 illustrates how community resilience actions like forming and maintaining a flood action group can lead to actions and outcomes of different types: some of these (the RED arrows) constitute steps in a pathway towards avoiding flood damages. The monetary benefit of the whole sequence of activities that make up the pathway could be

expressed in terms of the damage avoided. The BLUE arrows indicate activities/outcomes along the pathway that are linked to benefits which are harder to quantify in monetary terms, for example, during or after the development of a flood action plan, neighbours might get to know each other better or organise recreational activities which would increase welfare. It would be difficult to ascribe a monetary value to these activities but an assessment could be made based on different quantitative measures (for example, the number of flood wardens trained) or on qualitative measures of significance (High – Medium – Low significance).

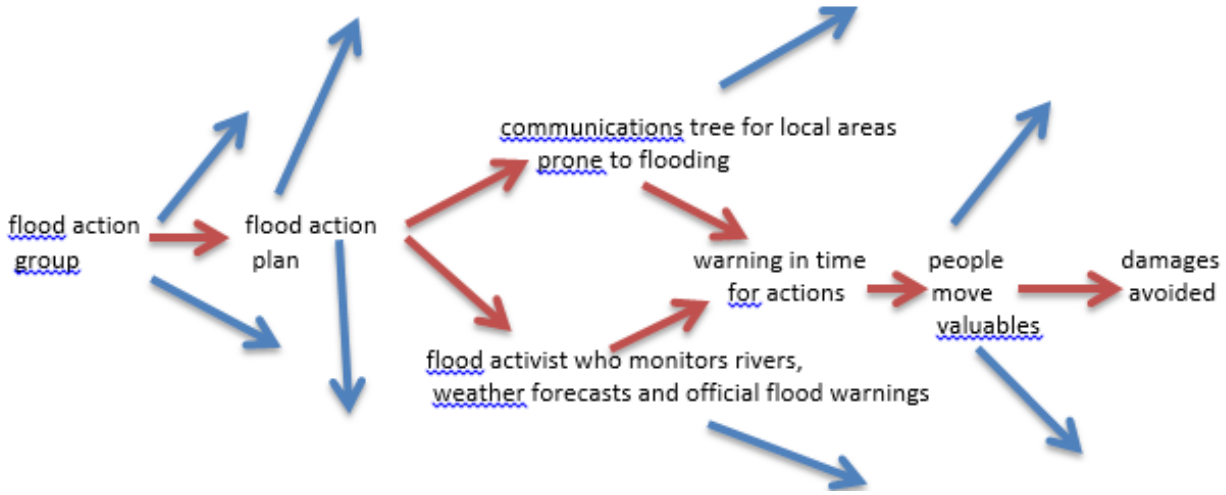


Figure 13.1: Understanding pathways from community flood resilience measures to benefits

The idea that community flood resilience measures can have multiple benefits is one of the elements of the mapping approach suggested. Working out the benefit-cost ratio for the implementation of an innovative community resilience intervention in terms of the damages avoided provides a partial measure of its benefit; the map highlights how such measures often have additional benefits which cannot be quantified with the knowledge and techniques currently available. The aim therefore was not to compare or rank the individual pathfinder projects in terms of value for money on investment but to identify the main benefits of their interventions, calculating the financial benefits where this was possible and providing an indication of any additional non-quantifiable benefits associated with the intervention.

This approach also links to the logic model framework in focusing on the sequence of actions required to achieve outcomes in terms of increased community resilience. Thinking about the combination of actions or conditions needed is the same process involved in working out the logic model for a project or intervention (see section 4: Framework).

Methodology

The methodology involved collecting information about the benefits of selected measures from the pathfinder managers using a template provided and subsequently analysing and comparing the evidence[35].

Gathering information on pathfinder benefits

Given the wide variety of activities undertaken by the pathfinders and the fact that, even where several ostensibly carried out the same activity, these might involve quite different components or processes, each pathfinder was asked to set out what they saw as the main benefits of their project, considering social and environmental as well as financial / economic benefits.

Pathfinder managers were invited to choose which of their interventions to assess and were provided with a template and guidance to help them. The steps included in the template are summarised in the box below. A learning event was also held[36] to discuss benefits and how these can best be presented. It was hoped that as well as providing a basis for a quantitative assessment of some of the interventions of each of the pathfinders, this would help to identify some of the main benefits of community resilience measures for which a quantitative assessment would be possible in future.

Box 13.1: Steps for the pathfinder project-level benefits assessment

1. Describe the main benefit(s) generated.
2. Indicate the scale of the benefit(s) described and the criteria used for determining this scale.
3. Show the variation in the scale of the benefit(s) according to the severity of the flood event ('return period'), choosing three return periods or frequencies of flooding for which information is available or for which the pathfinder can make estimates.
4. Indicate how soon the benefits described could be expected to begin to be seen and when they might reach their peak over the next 20 years.

Step 1: Describe the main benefit(s)

In order to simplify the assessment and focus on the kinds of damage most likely to be avoided by increased community resilience, the pathfinders were provided with a list of types of damages to households and communities based on the University of Middlesex's *Multi-Coloured Manual* (2010)[37] (see Table 13.1).

[35] The approach and method was proposed by Professor Denis Parker and reflects the work carried out with colleagues at the Middlesex Flood Hazard Research Centre, much of which is set out in the Multi Coloured Manual used in the appraisal of flood risk management investments (www.mcm-online.co.uk)
[36] In November 2014.
[37] Flood Hazard Research Centre, Middlesex University (2014) MCM-Online, Data and Techniques, Chapter 4 – Residential Property. Version 2 - May 2014. www.mcm-online.co.uk

Step 2: Estimating the scale of benefit(s)

Table 13.1 The range of possible flood impacts on households (not exhaustive)

Direct Tangible Losses For Flooded Households	Intangible Losses On Flooded Households	Indirect Tangible Losses On Flooded Households	Indirect Losses For Non-Flooded Households
• Damage to building fabric	• Worry about future flooding	• Permanent evacuation from area	• Increased travel costs
• Damage to household inventory items	• Loss of memorabilia and irreplaceable items and pets	• Disruption to household due to flood damage	• Loss of income/earnings
• Clean-up costs	• Damage to physical and/or mental health, death or injury	• Temporary evacuation costs	• Loss of utility services
• Damage to vehicles (cars)	• Loss of community	• Disruption due to flood warnings	• Loss of other services
	• Loss of confidence in authorities and services	• Loss of utility services	• Loss of leisure and recreational opportunities
		• Loss of income/earnings	• Increased cost of shopping and recreational opportunities
		• Loss of leisure and recreational opportunities.	
		• Additional communication costs	
		• Loss of services	
		• Increased travel costs	
		• Increased cost of shopping and recreational opportunities	

Pathfinder projects were encouraged to provide numbers for the benefits achieved wherever possible: if monetary values were not available, these might be numbers of homes etc. A method was also suggested for estimating the scale of the benefit where numbers would not be meaningful, for example where the benefit was seen as more cohesive communities. This uses a three-point scale (H – M – L) to assess benefit. A table was provided with a list of some of the kinds of benefits that it was expected might be achieved by pathfinder projects, including two new benefits (not found in the table from the *Multi-Coloured Manual (2010)*) considered to be relevant to the pathfinders' work: insurance premium benefit and community resilience. For each of the types of benefit, the measure of the benefit (for example, cost of damages avoided, number of properties

affected or a qualitative assessment of 'significant / very significant') was shown in terms of the H-M-L scale, in order to allow some comparison across benefits of different type.

The pathfinder project teams were asked to make their own assessments of the benefit provided by their actions, using either a quantitative or an H-M-L scale. Pathfinders using just a qualitative H-M-L scale were asked to say what factors they had considered in deciding the score. Table 13.2 below shows the tool provided to pathfinder projects for this purpose. They were also given the option of identifying other benefits.

Table 13.2: Scaling the benefit of community flood resilience actions

Benefit indicator	Low	Medium	High
No. of residential properties benefiting *directly*	0-10	11-50	51 and upwards
No. of residential properties benefiting *indirectly**	0-10	11-50	51 and upwards
No. of business premises benefiting *directly*	0-5 (rate as medium if any are large)	6-10 (rate as large if any are large)	11 and upwards
No. of business premises benefiting *indirectly**	As above	As above	As above
No. of infrastructures benefiting	0-1 (rate as medium if critical infrastructure)	2-4 (rate as high if any are critical infrastructure)	5 and upwards
Social equity benefit	Insignificant	Significant	Very significant
Insurance premium benefit	No change to premiums	Reduction in premiums	Reduction in premiums
Community resilience	Insignificant to minor	Significant	Significant
Other benefit			

* It might be better to have higher numbers for properties / business premises benefitting indirectly than for those benefitting directly as an indirect benefit is likely to be smaller. In practice, none of the pathfinders presented evidence on indirect benefits, so this issue did not arise.

Step 3: Show the variation in the scale of the benefit(s) according to the severity of the flood event ('return period')

Pathfinders were asked to choose three return periods or frequencies of flooding for which information is available or for which the pathfinder can make estimates, and to calculate the change in the benefit from the measures taken for each of these situations. In fact only four pathfinders completed this step.

Step 4: Indicate how soon the benefits described could be expected to begin to be seen and when they might reach their peak over the next 20 years.

Depending on the nature of the measures taken, the benefits may be seen immediately (or when the next flood event occurs) or they may take time to develop (for example, if the measures involve developing capacity to manage risk or respond to flood events). Some of the pathfinders presented this information but it was not provided consistently across all the projects.

Analysis of the evidence

The evidence received was checked for consistency and summaries of the information provided under each step were put into a spreadsheet.

The information was analysed in terms of the evidence provided for each of the steps in the template, in terms of the types of benefits identified and in relation to the benefit indicators.

Evidence from the pathfinders' assessment of the benefits of their projects

All of the pathfinder project teams made an attempt to assess the benefits of some of their interventions, as shown in Table 13.3. Eight pathfinders calculated some monetary benefits.

Table 13.3: Pathfinder project teams' own assessment of the benefits of their projects

Pathfinder project	Main Benefits	Qualitative assessment (H-M-L)	Monetary benefit estimated?	Source of evidence
Blackburn with Darwen	Flood action groups (7 FAGs and 1 gully watch group)	H	No	Groups formed
	Increased public awareness of flooding	N/A	No	Survey responses
	Increased confidence in the Council	N/A	No	Complaints received
	Increased uptake of flood insurance.	N/A	No	Survey responses
	Reduced risk of damage to business properties as a result of own improvement of flood defences	N/A	No	Visits to businesses
Calderdale	PLP measures reduce the risk of flooding to 39 residential and 23 business properties.	H	Yes	PLP installed
Chesham	Reduced risk of damage to residential properties	L	No	Flood awareness & surveys

Pathfinder project	Main Benefits	Qualitative assessment (H-M-L)	Monetary benefit estimated?	Source of evidence
	Reduced risk of damage to business properties and business continuity	L	No	Flood awareness
	Savings to Local Authorities.	L	No	N/A
	Social or community capacity building, community cohesion	H	No	Flood group
	Establishing networks	H	No	Flood group
Cornwall	Reduced risk of damage to residential properties	L	No	Properties receiving info
	Reduce risk of damage to 60 residential properties as a result of leaf litter clearance and highways drainage measures	M/H [38]	No	Measures in place
	Reduced risk of damages to 300 residential and business properties in Par, St Blazey and Lostwithiel as a result of leaf litter clearance and highways drainage measures	H	Yes	Value of 2010 flood damages
Devon	Reduced risk of flood damages to 410 properties In Braunton as a result of flood warnings & increased awareness	M	Yes	Measures in place
	Reduced risk of flood damages to 104 properties in Modbury as a result of community flood warnings	M	Yes	Measures in place
Liverpool	PLP measures reduce risk of damage to 27 residential properties	H	Yes	Measures in place
	Potential reduction in annual cost of insurance to 27 households as a result of PLP measures	L	Yes	1 property owner
	Reduction in stress and anxiety as a result of PLP measures	M	No	Measures in place
	Reduction in electricity bills as a result insulating effects of PLP measures	L	No	Measures in place
Northampton-shire	Reduced risk of damage to 248 residential properties and 60 businesses premises as a result of improved	H	Yes	Measures in place

[38] The Cornwall pathfinder assessed the social equity benefits as Medium and the community cohesion benefits as High

Pathfinder project	Main Benefits	Qualitative assessment (H-M-L)	Monetary benefit estimated?	Source of evidence
	maintenance of ditches and culverts, Community Rain Gauge and Warning System and Online Toolkit			
	Community Flood Risk and Mitigation Investigations increase capacity to manage flood risk	H	Yes	Measures in place
Rochdale	Reduction in risk of flood damage as a result of increased community engagement with flood risk (300 residential properties and 112 commercial properties).	M/H	No	Info / resources provided
	Volunteer input to flood risk management measures (river stewardship)	H	No	Volunteer days
	Joint action by stakeholder organisations increases effectiveness of flood risk management.	H	No	Project actions
	Increase in engagement of children and young people in community flood management actions.	H	No	Project events
	Reduction in risk of flood damage for deprived households	H	Yes	Future measures
Slough	Increased awareness of flood risk and capacity for action through Flood Action Groups	M	No	Project actions/Flood groups
	Reduced risk of damage to 25 residential properties through PLP measures	M	No	Future measures
	Increased capacity to manage flood risk as a result of Community Flood Plan.	M	No	Measure in place
Southampton	Reduced flood risk to 46 properties through implementation of property-level resilience measures and increased community capacity to manage flood risk through flood action group and emergency flood plan	M	Yes	Measures in place/ Flood groups

Pathfinder project	Main Benefits	Qualitative assessment (H-M-L)	Monetary benefit estimated?	Source of evidence
Swindon	Members of the community empowered to take action to reduce risk of flooding.	H/M	No	Survey
	Reduced flood risk as a result of Flood Action Groups' liaison with flood authorities	H/M	No	Project actions/Flood groups
	Increased confidence on the part of Risk Management Authorities in community-led approaches to flood risk management.	M	No	Interviews
Warwickshire	Reduced risk of damage to 152 properties as a result of reduction of blockages of culverts and improved warnings	H	Yes	Project actions
	Reduced flood risk as a result of increased understanding, empowerment and responsibility of communities	H	No	Project actions
West Sussex	Reduced risk of damages to 51 properties as a result of PLP measures.	H	Yes	Average spend per property
	Reduction in displacement costs from flooding	H	Yes	Survey
	Reduction in emergency response costs for Risk Management Authorities (police, FRS, local authorities).	N/A	Yes	Average per property protected
	Avoidance of damage to mental and physical health	H	No	N/A
	Works carried out by Risk Management Authorities as a result of better coordination with community flood groups.	H	No	Project actions/Flood groups
	Reduced risk of damages to property as a result of increased community awareness and household and community flood plans, contributing to increased capacity to prepare for and take effective action to deal with flooding	N/A	No	Project actions

Identification of types of benefit

Many of the main project benefits identified by the pathfinders were typical benefits of flood risk management projects and were included in the list of possible flood impacts on households (Table 13.3) provided to the pathfinders with the benefits template.

Ten of the 13 pathfinder projects estimated that their projects would provide **direct tangible benefits** to households and businesses by reducing the risk of flood damage to property. The reasons for the expected reduction in losses ranged from the installation of PLP measures (Calderdale, Liverpool, Southampton and West Sussex) or plans to install measures in the immediate future (Slough); to the implementation of measures to prevent flooding from blocked watercourses (Cornwall, Warwickshire), flood warnings and flood awareness (Devon, Northamptonshire, Chesham).

None of the pathfinder projects specifically mentioned the avoidance of damage to vehicles which is a direct tangible loss frequently affecting flooded households. Measures developed by many of the pathfinders in terms of improving flood warnings, agreeing community food plans and developing the role of flood wardens can contribute to ensure that residents move vehicles away from places at risk of flooding and this did in fact happen in Southampton in 2013-14.

Although seven pathfinder projects carried out activities to promote the uptake of insurance, for example by negotiating reductions in premiums and excesses, only two included improvements in insurance among the main benefits of their projects. Blackburn with Darwen estimated an increase in the number of residents with insurance cover, based on survey results, while Liverpool inferred that potential reduction in insurance premiums from the evidence given by one resident who had seen a reduction in their insurance premium after PLP measures were installed. As this was based on just one case, the evidence cannot be considered robust.

Calderdale's work resulted in four households managing to get insurance where they had not been able to before, or finding more reasonably-priced insurance, although this was not identified as a main benefit of the project. Across the pathfinder the proportion of householders saying they had contents insurance increased from 44 per cent to 73 per cent. Similarly, Cornwall did not identify the pathfinder's success in negotiating liability insurance for flood wardens in Lostwithiel as a main benefit. It was not clear whether the other three pathfinders that worked on increasing insurance cover saw any direct benefits from this work.

Benefits to businesses were mentioned by five pathfinders. Among the benefits described were reduced risk of damages and impacts on businesses continuity as a result of maintenance or improvements to water management (Blackburn with Darwen, Cornwall, Northamptonshire), PLP measures (Calderdale) and engagement and awareness-raising (Rochdale).

Two pathfinder project teams said that their projects had provided **intangible benefits** in terms of reducing worry about future flooding and mental and physical health impacts

(Liverpool and West Sussex). Liverpool attributed this benefit to the installation of PLP measures: this suggested that all four pathfinders that carried out PLP were likely to have provided this benefit to the households or businesses covered.

Only the West Sussex pathfinder identified an **indirect tangible benefit** of the project's measures: this was the reduction in travel costs for people in flood risk areas who had PLP measures installed. As in the case of the intangible benefits mentioned above, it was likely that any pathfinder projects whose measures reduced flood damage to the extent that people in flooded areas were able to remain in their homes would also achieve some benefit in terms of reduced travel costs.

All but three of the pathfinders also identified other important benefits which were not on the list provided. These included benefits to others apart from households, for example, the avoidance of costs to LLFAs and emergency services (in Chesham, Cornwall, Liverpool and West Sussex) and the contribution made by volunteers (Rochdale). The reduction in costs to LLFAs might feasibly be monetised but methodologies were not well developed. West Sussex made an estimate of the monetary value of this benefit in terms of a reduction in cost per property protected (see further discussion in the review of evidence of benefits).

Another potentially monetisable benefit was the contribution made by volunteers providing their skills and capacities free of charge on initiatives such as catchment management projects (Rochdale). Estimating the value of this contribution would require a good understanding of the volunteers' roles and activities. Existing research indicates that this is a complex area where greater understanding is needed (Environment Agency, 2013).

Many of the main benefits identified by the pathfinder projects fell into the category of 'intangibles'. These included increased local capacity for flood risk management as a result of creating community flood plans or carrying out flood risk investigations (Northamptonshire, Slough, Southampton, West Sussex) or through the empowerment of local flood groups (Swindon and Warwickshire). These are key elements of community resilience.

Scale of benefits

Most of the pathfinder projects followed the guidance for estimating the scale of benefits (Table 13.3), although a few of the pathfinders did not provide an assessment of scale of some benefits: for example, West Sussex did not give an H-M-L assessment of the reduction in costs to LLFAs or of the community resilience benefit; Blackburn with Darwen did not give an H-M-L assessment of increased awareness of flood risk, increased confidence in the Council, increased uptake of flood insurance or the reduced costs to businesses of taking measures to protect their properties. This may be because the pathfinder projects did not feel they had enough information to make an assessment or because of lack of certainty about the benefit realisation.

The assessment information provided is generally consistent with the values in Table 13.3. A few pathfinders appeared to have applied different criteria, for example Liverpool, with

46 properties seeing a reduction in risk of damages, estimated the benefit as High, whereas Devon estimated the reduction in the risk of flood damage to properties as Medium, in the case of a community with over 400 households.

Of the pathfinder projects reporting direct tangible benefits to households and businesses at risk of flooding through the reduction in the risk of damage to property, all except for Chesham assessed the benefit as High or Medium. Chesham reported it as Low which may have reflected uncertainty about the benefit: Chesham associated reduced risk of damages to property with the provision of information and increased awareness-raising. Taking the pathways mapping approach to identifying benefits described earlier, it was clear that a number of additional measures would be needed to ensure that awareness raising results in reduced damages.

Other reasons for differences in the assessment of the scale of benefits for similar measures may have been:

- Range of specific measures included under generic headings. Measures were generally referred to by generic descriptions such as PLP or flood warnings. However, the specific measure applied will affect the degree to which damage was avoided or reduced. For example, PLP measures may have prevented the ingress of flood water to the property (as in the case of the flood doors fitted in Liverpool) or reduced the damage caused if water does come in (e.g. by raising electrical fittings to prevent contact with flood water, as done in Calderdale). The anticipated reduction in damages was therefore a factor of the specific measures implemented, which vary between pathfinders but may also vary between properties in the same pathfinder.
- Reliance on secondary measures or ongoing inputs to assure benefit was achieved. Some PLP measures were 'fit and forget', which implied that with basic maintenance they will be effective throughout their recommended lifespan. However, most other types of measure depended on additional actions or inputs: moving cars or possessions out of the way of forecast flooding, regular clearance of culverts or brooks, etc. The effectiveness of individual or community level flood plans, for example, generally depended on people receiving timely warnings, which may in turn depend on having enough trained flood wardens in the area.

Variation in benefits in relation to flood return periods

Only four of the pathfinders attempted (Calderdale, Northamptonshire, Southampton and Warwickshire) looked at different flood return periods and the impact this would have on the project benefits. This would have required a more detailed level of knowledge and experience of assessment which was generally not available to the pathfinders. This is an issue of capacity that should be borne in mind in designing future evaluations.

Two of the four pathfinders that estimated the economic benefit of installing PLP measures to reduce the risk of flood damage to residential property (Calderdale and Southampton) looked at three different flood return periods to show the variation in the benefit depending on the severity of the flood event. The Calderdale pathfinder (which had a total grant allocation of £345,554) also installed PLP measures in business properties and included

these in its estimate of benefits. The 39 residential and 23 business properties in Calderdale that benefited from PLP measures have on average an expected flood return rate of 40 years. The pathfinder estimated that the PLP works would reduce the risk of damage and disruption by more than £1 million over the next 20 years in today's money.

The Southampton pathfinder (which had a total grant allocation of £472,000) installed PLP measures in 46 properties. In a 1 in 20 year flood scenario, the benefit would be relatively low (£120,000), with the measures protecting only six of the properties. The pathfinder estimated that the benefit would rise to £580,000 in a 1 in 100 year event, when 41 properties would be protected from flooding[39].

Few of the pathfinders had in-house skills in economic assessment and there may be gaps in their assessments or cases where assumptions are not robust. For example, only West Sussex tried to include the economic benefit of avoiding people being forced to move out of their homes temporarily or permanently.

Timing of benefits

Four of the pathfinders (Devon, Northamptonshire, Rochdale and Southampton) estimated both the start and peak time for the benefits to be obtained. Some other pathfinder projects indicated that the benefits would be obtained from Year 1. Two pathfinder projects that are taking forward the installation of PLP measures indicated that the benefits would begin to flow when the measures were in place.

Devon and Northamptonshire considered the factors that might affect the timing and achievement of benefits. Devon indicated that the peak time for the benefits would be 3 to 5 years after the project when the measures were installed and functioning effectively and the groups were in place to provide warnings and other community resilience roles. After this period, uncertainties about the maintenance of the groups mean that there is a risk that the benefits might reduce. Northamptonshire put more emphasis on the time needed for physical equipment such as rain gauges and the information resource created (the online toolkit) to be in place and used effectively. Northamptonshire estimated that this process might take between two years (for the online toolkit) and five years (for the rain gauges) to be providing full benefits. After this initial period, the assumption seems to be that the resources would continue to operate at a steady level.

Review of evidence of benefits

This section examines the evidence of the different types of benefits identified by the pathfinder projects.

[39] A further five properties were protected against damage in the case of a 1 in 1000 year flood.

Benefits of PLP measures

A description of the approaches used by Calderdale and Southampton to calculate the benefits of their PLP measures was given above (in the section: Variation in benefits in relation to return periods). The other two pathfinders that estimated the benefits of reducing the risk of damage to properties through PLP measures (West Sussex and Liverpool) used a different method, assuming an average rate of return on investment of 4.8 for each £1 spent on PLP measures, based on research on PLP carried out for Defra (2012). The West Sussex pathfinder invested an average of £6,000 per home in PLP measures to protect 51 homes; it was suggested that this could have a benefit of £1,468,000. The Liverpool pathfinder used a similar approach: using the same rate of return on investment, the approximately £200,000 spent on PLP measures to protect 27 homes might be expected to yield a benefit of £960,000.

The calculation of benefit based on the rate of return on investment is less robust than the methodology used by Southampton and Calderdale, as it assumes that the damages avoided are the same for all properties in any kind of flood event.

Other pathfinders also estimated benefits of installing PLP measures. However, where the PLP measures have not yet been installed and only the initial surveys have been carried out, these calculations have not been included, as it was felt that there was not sufficient evidence that the benefit would be achieved.

Benefits of flood warning

The Devon and Northamptonshire pathfinders estimated the benefit of reducing the risk of flood damages by providing flood warnings. Both pathfinders assumed that flood warnings will result in all at risk households moving property out of the way of flooding.

- The Devon pathfinder estimated that flood warnings and increased awareness measures taken by the project in Braunton, Devon, would result in 11.5 per cent of 3552 property owners reducing losses by moving valuables out of the way of flooding; that is a reduction in damages to 410 properties. According to the pathfinder project team, the benefit of completely avoiding flooding of 410 properties would be approximately £5,866,366. However, Middlesex Flood Hazard Research Centre calculates the benefit in terms of reduced damages for residential properties receiving a flood warning at roughly 7 – 9 per cent of the total potential loss (including loss of possessions or inventory items)[40]. The amount of benefit also depends on how long before the flooding the warning is given. Assuming the effectiveness of the measures and based on a conservative value of 7 per cent, the benefit of the measures taken by the pathfinder project in Braunton could be estimated as approximately £410,645.

  The benefit of this kind of measure should ideally be calculated by comparing the situation in the community where the awareness measures were taken (Braunton) with a community where no awareness measures in order to see whether there

[40] Personal communication, Simon McCarthy, Middlesex Flood Hazard Research Centre.

might be other factors influencing the probability that householders take action to avoid potential damages. However, in this case potential damages avoided have been calculated irrespective of what would happen without awareness measures.

- A similar estimate is made for the benefits of flood warnings in Modbury, Devon. Here it is estimated that community flood warnings will result in a reduction in the risk of damage to 16 per cent of at risk properties (104 properties), equivalent to a benefit of £703,960. Again, based on Middlesex FHRC methodology, only 7 – 9 per cent of this loss can be reduced by flood warning: a conservative estimate of the potential benefit would put this at approximately £49,277.
- While the total estimated benefit for the two locations (£459,922) is much lower than the benefit calculated by the pathfinder, it is only slightly lower than the total Defra funding for the Devon pathfinder (£488,400) which worked with 24 communities.
- The Northamptonshire Pathfinder estimated the economic benefit of three associated measures: Community Flood Risk and Mitigation Investigations, community rain gauge and warning systems and the provision of an online toolkit to support individual and community flood resilience. This represents a welcome recognition that several strands of action may be required to achieve resilience outcomes or benefits. The cumulative impact of these three strands of work was estimated to result in the avoidance of damage to 674 properties, based on a return period of 1 in 30 years. If average damages per residential property are £33k per property, the pathfinder suggested that the total financial benefit would be £22.2m. However, as in the case of the Devon measures discussed above, only a proportion of the total potential damages could be reduced by warning and information measures, so the actual benefit is likely to be considerable less.

Benefits of infrastructure measures such as trash screens, pumps and CCTV monitoring in reducing flood damage

The Warwickshire pathfinder used the *Multi-Coloured Manual* (2010) to calculate the benefit of its infrastructure improvement measures, based on flood duration of less than 12 hours, with a depth of 0.3 m above the upper surface of the ground. Here the difference between economic and financial benefit was calculated: the economic value of the damages avoided was based on £25,070 per property; the financial value was based on £38,032 per property.

The Northamptonshire pathfinder used a similar approach to calculate the financial benefit of reducing flood damage to 248 residential properties and 60 businesses premises as a result of improved maintenance of ditches and culverts. The benefit value is based on an estimate of £30,000 damages per residential property per flood event and £60,000 damages per industrial property per event.

The limitation of these calculations is that they assume that the measures taken successfully prevent all flooding to the properties identified. It is also unclear what future expenditure would be needed to maintain the level of protection, for example to ensure that trash screens are cleaned or that CCTV camera footage is monitored and appropriate

action taken. In one area of Warwickshire (Shipston), the measure taken was described as research into natural flood management, so further measures and investments would need to be taken after the research was completed, in order to put natural flood management in place.

Savings to local authorities and emergency responders

Four pathfinders (Chesham, Cornwall, Liverpool, West Sussex) suggest that the local authorities and other Risk Management Authorities will see a reduction in costs as a result of communities becoming more resilient. For West Sussex, the benefit comes from the overall reduction in risk of flood damage to properties: '*Reduced costs to emergency responders (Police, Fire & Rescue, Ambulance; Local Authority; Environment Agency) as a result of reduced damages to properties.*'[41]

Research by Penning-Rowsell *et al.* (2013) estimates emergency services' costs for dealing with flood incidents at 10.7 per cent of property damage in the case of regional scale flooding and 5.6 per cent in the case of localised urban flooding. However, the amount of the savings will be very dependent on the characteristics of the flood event. Repeat flooding will also affect the benefit.

Community resilience benefits

Eight of the pathfinders mentioned the development of community capacities and involvement in flood risk management as one of the main benefits of their projects. These benefits were generally assessed as High. Sometimes the benefit was linked to the achievement of measures that were priorities for local residents but that hadn't been addressed by risk management authorities in the past. This brought further benefits in terms of building trust and confidence in the authorities in the local community.

Transferability of benefits

Most of the approaches for calculating different types of benefits of the interventions were trialled by two or more pathfinders and found to provide an estimate of the scale of the benefit, if not a robust number to use in cost-benefit assessment. With improved approaches and methods for benefit calculation, it should be possible in future to identify similar types of benefits of interventions to build community resilience. The scale of the benefit will be influenced by factors such as the level of exposure and the type and frequency of flooding.

To a great extent the pathfinders' efforts were limited by the lack of clear methodologies for establishing financial benefit in the case of community resilience measures, rather than by any inherent impossibility of making this kind of calculation. The fact that many teams did not have access to economics expertise (internal or external) made the task still more

[41] West Sussex Year 2 Evaluation Report, April 2015.

difficult. This is an aspect of the evaluation of this kind of programme that should be considered early on.

Conclusions

All of the pathfinder project teams provided information and a basic assessment (on an H-M-L scale) of the main benefits achieved. Nine pathfinder projects estimated the monetary benefits of some of the measures. The measures for which benefits were most often provided in monetary values were reductions to the risk of damages to properties as a result of PLP measures, avoiding blockages to culverts and watercourses or providing flood warnings.

While many of the estimates of financial benefit provided by the pathfinders would require further work to make them more robust and this would potentially result in lower values for the benefits assessed, there was enough evidence to suggest that combinations of measures of the kind tested through the projects, which combined community capacity building with warnings and information and physical measures to prevent flood waters from entering properties, added up to provide significant benefits.

The pathfinder projects have identified and explored a wide range of potential benefits of their activities and provided pointers for future monitoring and analysis, as well as highlighting the need to develop methodologies that are more appropriate for assessing the scale of benefit provided by increasing community capacities. Given that most of the types of benefit identified were achieved by more than one pathfinder, it can be assumed that the benefits are transferable.

Key messages

- Staff working on community flood resilience initiatives need support to be able to carry out economic assessment of their projects. Staff recognise the importance of economic assessment, but generally lack the skills to make this kind of assessment.
- Relatively simple and familiar measures, such as PLP or clearing blockages affecting drains and culverts, can have significant financial benefits for local residents: in Calderdale the estimated benefits, over the next 20 years, for the 62 properties receiving PLP measures are equivalent to about three times the total value of the Defra grant (which was used for a range of interventions, not just PLP).
- The benefits were calculated in relation to specific interventions, for example to provide or improve physical infrastructure, to increase awareness and the coverage of flood warnings. However, more needs to be done to explore ways of calculating the benefits of intangible changes, such as the increased institutional resilience and community capacities generated by the creation or development of flood groups.

14. Counterfactual and Legacy of the Pathfinder Projects

Key findings

What would have happened without the scheme?

- Two pathfinder project managers believed that the local authority would have implemented some infrastructure activities level (i.e. for PLP and highways drainage) with alternative sources of funding available at a national level (e.g. from the Flood Defence Grant in Aid (FDGiA) or Repair and Renew grant). In four other cases, the pathfinder projects supported and enhanced ongoing initiatives.
- Limited community engagement or sharing of agendas and learning, collaborative working, and the building of new networks within and between local authorities and communities. The scheme has provided resources and capacity to undertake these activities at a level that would not have otherwise been possible.
- Without the scheme there would have been no evidence produced of the impact of the interventions and processes developed by the projects to increase community resilience to flood risk across the UK to learn from, build on and leave a lasting legacy.

Legacy

Processes and structures have been put in place for sustainability of interventions across the five categories of resilience by all pathfinder projects.

Social resilience:

- Nine pathfinder communities have identified vulnerable individuals and groups and implemented processes through flood plans. Flood risk awareness raising information has been produced by eight pathfinder projects. These materials can now be used by these and other projects and communities to improve community preparedness and awareness, and to increase the ability of individuals to cope physically and mentally with flood risk.

Community capital:

- Improved knowledge, engagement and empowerment; development of horizontal links between citizens (e.g. through the 111 flood groups established and maintained, the process of developing and practicing flood plans); and community involvement in practical measures (e.g. voluntary gully cleaning, riparian management, culvert watching, attenuation ponds).

Economic resilience:

- The experience of the NFF in negotiating with insurance companies and the information provided on its website will continue to be useful tools.
- The focus on engaging businesses to develop flood plans in Blackburn with Darwen provided a valuable output.

Institutional:

- Building institutional capacity and learning: the scheme has led to a change in the way flood resilience work is approached by local authorities and how they gain new knowledge, understand the topic, and involve communities in decision-making processes.
- Networks have been developed between flood groups in Cornwall, Devon, Warwickshire and West Sussex. The Chesham, Devon, Warwickshire and West Sussex pathfinders reported that the pathfinder emphasis on community engagement has sparked interest in creating flood groups in other communities and local authorities.

Infrastructure resilience:

- 163 residential and 23 business PLP installations and 39 flood stores have been established.
- While activities like developing emergency action plans or PLP installations are not new, the changes in governance are innovative developments.

Introduction

This section looks at what added value has been achieved by the pathfinder projects that would not have happened without the scheme, that is, the 'counterfactual'. As set out in section 4, due to the specific characteristics of the projects this is based on a self-reported, qualitative assessment and not a counterfactual approach. This section also focuses on the structures and systems that the projects have put in place to enable communities to be resilient to flooding in the long term and interventions to be self-sustaining with potential to be applied in other areas.

What would have happened without the pathfinder scheme?

Two pathfinder project managers interviewed believed that the local authority would have implemented the activity with alternative sources of funding available at a national level. In Southampton, the council would have applied for Flood Defence Grant in Aid (FDGiA) funding for PLP measures. In Chesham, Transport for Buckinghamshire (the County Council's transport department) would probably have applied for funding for highways drains clearance from monies made available by central Government following the 2013-14 winter flooding.

In four other cases, the pathfinder projects supported and enhanced ongoing initiatives: Cornwall Community Flood Forum, West Sussex's work with local community groups (Active Communities funding), upland land management initiatives supported by Calderdale Council, and drainage improvements by Blackburn with Darwen Council. In the case of Devon, without the scheme the Environment Agency would have undertaken work with 14 out of 24 of the pathfinder communities in Devon, but as a result of the grant PPE

and PLP work was undertaken with additional communities and at a quicker pace than would otherwise have been possible.

Most pathfinder project teams reported that some community engagement related to flood resilience would have occurred without the scheme, but it provided resources and capacity to undertake such activities and to employ a community-level approach that would not otherwise have been possible. All pathfinder project teams identified this as a key value added by the scheme. The impacts of the projects have been seen to catalyse shared agendas, local networks and changes in governance, in particular valuing the community voice and better links within communities as well as between communities and institutions. Comments from pathfinder project managers interviewed include:

> '*The use of NFF as an independent organisation to engage with communities rather than through local authorities [would not have happened without the project]*.' (Interviewee 12PM)
>
> '*The community resilience campaign wouldn't have been so focussed on grassroots [without pathfinder]; it would have been more top down*.' (Interviewee 13PM)
>
> *'The emergency plans don't really engage people and many residents have said this is the first time anyone has spoken to them about flooding*.' (Interviewee 9PM)
>
> *'While funding would probably have been obtained for PLP measures (via FDGIA), it would not have covered community engagement or coordination…. We wouldn't have had the knowledge and expertise of community engagement that the NFF brought.'* (Interviewee 10PM)
>
> *'Although we would have given [the flood groups] a level of support without the pathfinder, it wouldn't have been the intense support to get them to where they are now.'* (Interviewee 2PM)

In addition, at the project-level, all pathfinder project managers commented that the extent to which projects, partners, learning and agendas have been shared and joined-up through the scheme would not have happened without the scheme. This has added value and led to new opportunities and linkages, such as, the Liverpool pathfinder's work with BRE, the Joseph Rowntree Foundation, Southampton University and STAR-FLOOD.

The impacts of the projects have also been seen to catalyse shared agendas and networks at the community level, such as those developing between flood groups in Cornwall, Devon, Warwickshire and West Sussex. The Chesham, Devon, Warwickshire and West Sussex pathfinders reported that the pathfinder emphasis on community engagement has sparked interest in creating flood groups in other communities and local authorities.

From an evaluation perspective, without the scheme there would have been no evidence produced of the impact of the interventions and processes developed by the projects to increase community resilience to flood risk across the UK to learn from, build on and leave a lasting legacy.

Sustainability and legacy

The scheme ended in March 2015 and no further pathfinder budget is to be made available by Defra. There are challenges in maintaining the progress made through the pathfinder projects, ensuring that the work continues in the long term[42] in the project areas as well as passing on a legacy to other projects and communities, in terms of learning from experiences, establishing structures and processes, and catalysing change. The majority of pathfinder projects considered exit and succession-planning throughout the two year scheme and many implemented structures, systems and strategies to support long term sustainability. This section draws out examples of these under the five categories of resilience.

Social resilience

Flood risk awareness raising information has been produced by eight pathfinder projects to increase awareness, understanding and the range of audiences reached, including vulnerable groups such as children and youths, elderly people, those with English as a second language or no computer access. These materials could now be used by other projects and communities, but it is generally not clear what systems have been put in place to keep them up to date.

Increased resilience of vulnerable people through identification and processes in place through community flood plans in nine pathfinder communities has improved community preparedness and awareness of communities and individuals and increased the ability of individuals to cope physically and mentally with flood risk. The flood plans will need to be kept up to date in order for this legacy to be realised.

In Liverpool, the work on targeting residents in areas of multiple deprivation for community engagement has been combined with Liverpool City Council's Healthy Homes and Fuel Poverty programmes. Embedding flooding initiatives into wider, social issues (for example, housing, poverty, litter, etc.) and dialogue, rather than addressing flooding in isolation has been seen to help some pathfinder communities to see the relevance, particularly in areas that have not recently flooded. This is an important lesson to pass on to other projects and communities, and could lead to sustainable flood resilience.

Community capital

The main outcomes of pathfinder project activities related to community capital and building capacity in terms of flood risk are improved knowledge, engagement and empowerment; development of horizontal links between citizens (e.g. through the 111 flood groups established and maintained by pathfinder projects, the process of developing and practicing flood plans, and as an secondary effect of attending flood fairs); and community involvement in practical measures (e.g. voluntary gully cleaning, riparian

[42] For purposes of measurement, here 'long term' is deemed to be at least five years following the scheme's completion (2015–2020).

management, culvert watching, attenuation ponds, etc.). The earlier discussion of institutional resilience highlights that interventions led by community priorities (rather than the priorities of the flood management institutions) appear to result in more effective flood resilience in the long term.

A number of pathfinder project managers interviewed suggested that their projects' legacies would include flood information booklets, e-learning packages, online toolkits, DVDs and resource hubs for use by pathfinder, and other, communities and local authorities they have developed. For example, the aim of Calderdale's 'eyeoncalderdale' website is to "*build local ownership and social capital continuing beyond the project end*" featuring blogs from flood groups, advice and guidance information. However, the extent of impact these top-down materials will have in the long term is questionable and would need to be measured in the future.

Economic resilience

The experience of the NFF in negotiating with insurance companies and the information provided on its website will continue to be useful tools in pathfinder communities and others.

The focus on engaging businesses to develop flood plans in Blackburn with Darwen provided a valuable output. With regular use and testing, it was hoped that the plans will leave a lasting legacy in terms of reducing the businesses' own flood risk and in reducing flood risks to other commercial and residential properties in the area. Increased business confidence and resilience in pathfinder project areas may leave a lasting legacy, but it was difficult to assess without testing and without knowing if there was a plan in place for someone to encourage businesses to update and test their plans

Institutional resilience

The agenda and activities undertaken by all the pathfinders have been influential both within and beyond the project communities and local authorities. Reaching out to partners and institutions at both the local and national scales has established valuable partnerships and brought multiple direct and indirect benefits for pathfinder project areas. These aspects provide scaffolding for long-term sustainability of the projects' outcomes, as well as opportunities to use the projects as a springboard to share learning and to enable the benefits of the scheme to be spread to other communities and local authorities.

Table 14.1: Examples of Institutional structures / systems from the projects

Institutional structure / system	Examples from the projects
Multi-agency meetings, improved and more formalised relationships between agencies and	• Cornwall pathfinder has improved relationships between landowners and their local parish and town councils, whilst also making landowners aware that the council small grants scheme may be relevant to them. • Liverpool pathfinder reported that bringing the Environment Agency, local authority, United Utilities and the community flood group together was a major

Institutional structure / system	Examples from the projects
communities	achievement in itself and they hoped this would continue.
Collaboration between pathfinder projects	• Increasing the availability of information and exchanging expertise and practices avoids duplication of work, increases resource efficiency and enables testing of outputs in other locations. In such cases, this could have a positive effect on the duration of the legacy. For example: • Devon and Cornwall pathfinders with delivering flood warden training, • Swindon and Rochdale pathfinders with developing a Scouts badge.
New governance structures that embed flood resilience community pathfinder work into local authorities and link to a wider resilience agenda	• Pathfinders trained existing neighbourhood officers in flooding issues to ensure continuity of the work, e.g. Blackburn with Darwen. This suggests an acknowledgment by pathfinder projects of the need to take resilience out of the sole domain of civil protection and response and to integrate it into the social protection sphere. Neighbourhood officers have important skills that can lead to innovative community working. • Calderdale: moved their '*agenda from delivering the community strand of the pathfinder to a wider continuity body. This has buy-in from the three flood groups staffed by volunteers, local councils, the Environment Agency and Calderdale*.' • Cornwall: the legal structure of the Cornwall Community Flood Forum (CCFF) has been changed to provide a more formal status. The management board has been extended with greater representation from the community with the aim to make the CCFF more sustainable. Cornwall Council as Lead Local Flood Authority has given its continued support to the CCFF which has become involved in the Community Emergency Planning Group for Cornwall County Council. • Chesham: it is intended that the establishment of the Chesham Water Group will extend the legacy of the pathfinder project. • Devon: the Multi Agency Community Resilience Board was set up in 2014 with a view to launching Devon Community Resilience Forum in October 2015. • Liverpool: Liverpool City Council is aiming to replicate pathfinder project and implement learning in other communities across the city. The project manager has given presentations and interviews for various research projects, including for an evidence review for the Joseph Rowntree Foundation on Locality and Community Resilience to Climate Change, for which the Liverpool Pathfinder was used as a case study. • Rochdale: pathfinder steering group has become the Rochdale Community Resilience Project to maintain momentum. • Warwickshire: additional funding sought for a fulltime community engagement officer to continue to support flood action groups established through the pathfinder scheme for another three years. Joint venture with Worcestershire County Council. • West Sussex: involvement of the Community Development Team is helping to achieve sustainability.
Flood groups	• The majority of the 111 flood groups established or maintained through the pathfinder scheme have the potential to be self-sustaining. Improvements in the confidence of pathfinder communities indicate that they are likely to continue to be actively engaged in delivering flood resilience. • A number of pathfinders have strengthened the sustainability of their flood groups and helping communities to take ownership of their groups, such as by developing their internal governance structures, providing financial means, encouraging groups to create formal positions such as chairperson, secretary and treasurer and to open bank accounts. • Introducing flood forum networks and community resilience forum and pathfinders' resilience work being embedded into local flood risk management strategies are some of the structural alterations by pathfinder projects that

Institutional structure / system	Examples from the projects
	have been implemented for a sustainable legacy.
Institutions have offered their support for flood warden training	• Northamptonshire: '*The flood wardens will be provided with two-yearly training; [and we] will be following up the flood plans. There is also other training via voluntary organisations*.' • Cornwall '*The Environment Agency, Police and LRF continue to offer support for the training package so it can be made available to communities in the future. We have also looked to community volunteers to act as trainers to help make this a sustainable project. The CCFF has been working closely with the Big Lottery to plan a bid for additional funding to extend the training and toolkit and make it available to other areas of the country interested in using it*.'
Embedded into the Scouts movement	• Gully watch, river stewardship and Scout badge actions have become part of the Scout movement's activities after initial support by the Calderdale, Swindon and Rochdale pathfinders.
Development of the NFF as a trusted intermediary for community engagement and resource hub	• In some cases, the NFF project officer role is set to be an ongoing and expanding role. The NFF's website brings together pathfinder materials and resources, and will provide an important source of flood information to be used in the future, as part of a multi-layered approach to community engagement. The extent to which pathfinder work/legacy is embedded into a local authority could be dependent on an NFF officer and funding to have such a role. • Some areas adjoining pathfinder project areas have initiated similar projects with the NFF (e.g. Worcestershire, Shropshire and Staffordshire). Other projects have been initiated with Severn-Wye and Trent-Humber RFCCs.
Development of flood plans	• Altogether, 1990 community flood plans across eight pathfinders were established during the project implementation. As for businesses the number of flood plans prepared is significantly higher: 825 by seven pathfinders. These plans have identified the most vulnerable people, indicated safe houses among other valuable information for flooding adaptation, however, the extent to which there is recognition that these need to be dynamic documents that are continuously checked, revised (e.g. contact details) and tested in the long-term is not clear. Further infrastructure outputs include PLP measures (implemented by six pathfinder projects), flood stores (39 flood stores across seven projects) and tool kits.

Infrastructure resilience

As a result of the scheme, there are now 163 residential and 23 business PLP installations and 39 flood stores established, all of which will be in place for the foreseeable future.

While activities like developing emergency action plans or PLP installations are not new, the changes in governance is an innovative development, in particular in giving the community a say and having better links with communities. Comments from pathfinder project managers interviewed include:

> *'The emergency plans don't really engage people and many residents have said this is the first time anyone has spoken to them about flooding*.' (Interviewee 9PM)

> *'While funding would probably have been obtained for PLP measures (via FDGIA), it would not have covered community engagement or coordination. I don't know what uptake we would have got… we have nearly 100 per cent but not sure that we would have had the same uptake. We wouldn't have had the knowledge and expertise of*

community engagement that the NFF brought. And we wouldn't have got the flood planning element and the recognition of vulnerable people.' (Interviewee 10PM)

'There would also have been less community awareness of the Community Emergency Plan (CEP) and less CEPs.' (Interviewee 4PM)

Two projects have worked on changing existing policy and influencing future drainage plans. Calderdale has initiated a new policy on uplands and river sustainability and Rochdale is hoping that the newly created flood groups will provide community input into the drainage investment plan for 2015-2020. This plan would include infrastructure amongst other issues and would plan where it is targeted and how it is delivered.

Key messages

Key factors for achieving a lasting legacy:

- Embedding flooding initiatives into areas such as housing, poverty / regeneration, waste management, etc. can be effective in helping communities to see the relevance of flood resilience, particularly in areas that have not recently flooded.
- LLFAs can increase ownership of flood planning and initiatives by taking time to understand community priorities and putting these at the heart of flood resilience interventions.
- Flood risk management authorities can build on the approaches and tools developed by the pathfinders for promoting practical flood resilience measures, in order to carry out their duty under the Civil Contingencies Act to provide advice on business continuity management.
- The pathfinders have developed approaches and tools for promoting practical flood resilience measures to local businesses which other LLFAs can draw on in carrying out their duty under the Civil Contingencies Act to provide advice on business continuity management.
- Collaborative working and the sharing of learning and agendas within and between local authorities should be promoted in order to improve initiatives as well as building a pool of shared knowledge and resources.
- While the provision of infrastructure is an important part of community resilience, make sure that it is managed in a way that works with and builds community processes and organisations and enhances local capacity.
- Sustainability of interventions should be considered from the outset of a community project. It is important to develop and implement an 'exit strategy' comprising a succession plan, processes and structures that will enhance community capacity, ownership and participation, and help to maintain and build on interventions after programme funding ends.
- Project objectives and interventions should be valued and supported by local authorities.

15. Discussion and Conclusions

Introduction

The evaluation has examined how successful the pathfinders have been in achieving the scheme's objective of developing and testing innovative solutions that:

- Enhance FRM and preparedness in ways that quantifiably improve the community's overall resilience (including consideration of flood resilience and social vulnerability characteristics and how these may change over time).
- Demonstrably improve the community's financial resilience in relation to flooding.
- Deliver sustained improvements which have the potential to be applied in other areas.

The extent to which the pathfinder met these objectives is examined in the following sections, as well as the areas in which the projects encountered greater challenges. The report then looks at what has been achieved that could not have happened without the pathfinders and identifies successes and innovations that were not foreseen at the start of the work. Finally, there is a reflection on the methodological approach used in the evaluation and its value in making sense of a new and relatively unexplored area of intervention.

Improving overall community resilience

For the evaluation Cutter *et al*'s 2010 framework was used to unpack the multidimensional nature of community resilience and this is captured in the definition below:

> *Communities working with local resources (information, social capital, economic development, and community competence) alongside local expertise (e.g. local emergency planners, voluntary sector, local responders) to help themselves and others to prepare and respond to, and to recover from emergencies, in ways that sustain an acceptable level of community functioning.* (adapted from Twigger-Ross *et al.*, 2011: 11)

Five categories of resilience capacity:

- **Community capital**
- **Social Resilience**
- **Institutional Resilience**
- **Infrastructure resilience**
- **Economic Resilience**

Across the pathfinders a number of key achievements can be identified. Key achievements by resilience capacity are presented in Table 15.1.

Table 15.1 Key achievements by the pathfinder projects by resilience capacity

Resilience category	Key achievements
Social resilience	• Vulnerable individuals and groups identified in community flood plans • Flood information is now available in different languages and media
Community capital	• Increased community awareness, cohesion, empowerment, participation • Improved knowledge of roles, responsibilities and flood risk • Community engagement approaches that could be applied to other areas • Expansion of the National Flood Forum – to continue as a trusted intermediary and resource hub • Resources produced: toolkits, guidance, lesson plans, presentations, leaflets, websites, social media existence, etc.
Economic resilience	• Insurance cover for trained flood wardens • 825 flood plans in place for businesses
Institutional resilience	• Establishment and maintenance of 111 community flood groups, as well as community flood forums and networks • Flood warden training and course materials • Training of local authority officers • Governance processes and networks developed with links to wider resilience agenda • Improved multi-agency partnership working and sharing of learning within and between local authorities • 1990 community flood plans in place
Infrastructure resilience	• 163 residential and 23 business installations • Innovative drainage improvement and maintenance measures, e.g. volunteers' involvement in leaf litter clearance, trash screens, rain gauge development, etc. • 39 flood stores established

The key point about Cutter *et al*'s 2010 (and others) conceptualisation of resilience is that of multidimensionality, recognising that to build resilience requires activities across a range of capacities. Evidence from the pathfinders showed how different areas of resilience are interrelated and co-dependent. For example, there is a close relationship between community capital and institutional resilience which was manifest in a number of ways. Firstly, some flood groups were developed out of pre-existing networks between community members in local areas, some of those networks in themselves had emerged from flood events (e.g. in West Sussex) which the pathfinder project was able to build upon. Secondly, flood groups themselves have taken on community capital building tasks by putting on awareness raising activities thereby reaching out to other parts of their local communities and forming new networks between citizens but also by linking them into the flood risk management governance network. Thirdly, institutional resilience building activities have led to increased community capital (e.g. in Southampton the development of the residents working group which worked with the council on flood issues has led to increased support between residents in a flood situation: evidence of stronger ties and relationships between those people). Another key area where there is a link, is between the institutional capacities and the infrastructure development, specifically between flood volunteers / flood groups and the uptake of PLP as was the case in Liverpool. The full details are given in the case study in Box 12.2, but a key point in the delivery of the PLP scheme was that there was a local community champion who was prepared and supported

by the pathfinder and NFF to act as a liaison point between the residents and the appointed contractor. Given this close relationship it can be seen that successes have been gained when activities across different capacities are co-ordinated.

A key aspect of Cutter *et al*'s 2010 framework is the idea that resilience to disasters builds on what is already present in the community and that ideally activities or interventions are designed to improve that underlying resilience as well as provide specific skills to help with the disaster management. In the above discussion and within the sections of this report there is evidence of how an understanding of what is already in place within a community is vital if interventions are to be successful. The section on community engagement highlights the success of engagement when it is led by the needs of the community, be those flood related or not. Where engagement with local communities was less successful it could be traced to a lack of awareness of the nature of that community. By the same token, those areas where there were high levels of existing capacity (e.g. Cornwall which started with 30 flood groups and a flood forum) they were able to build on that existing capacity and in that case develop training for flood volunteers. There is another issue that needs to be drawn out within this discussion of pre-existing capacities and one that was evidenced across the Pathfinder schemes. Specifically, capacities are not evenly distributed across the country or indeed across the pathfinders, some were in many ways starting from scratch and others were starting from a much higher base. In terms of outcomes we would suggest that inequality has been maintained across the pathfinders. This is not surprising given that those inequalities are linked to larger systemic inequalities across the country, which need tackling across the board, and have less chance of real change at the local level.

As well as the interrelatedness of resilience capacities, the pathfinder scheme provides evidence for the importance of developing relationships between citizens (bonding and bridging capital) and between institutions and citizens (linking capital). Much of the pathfinder work focussed on these relationships around which flood risk management knowledge, actions, and planning were developed.

Finally, in line with findings from interventions reported in the REA the central role of community engagement in developing all the capacities was evident across the pathfinder scheme. Community engagement refers to the work that was carried out to meet with people in communities, talk with them about flooding and other issues, build up trust and carry out actions to manage flood risk locally. What was clear from the pathfinders was the importance of having staff with the right skills to carry out this work effectively. The NFF with its national network was key to that being effective through the pathfinder scheme as a whole.

Improving communities' financial resilience to flooding

Eleven of the pathfinders undertook measures to increase individual or community financial resilience to flooding. As well as investigating how and how far financial resilience was improved, the evaluation also examined how far the financial resilience measures implemented were transferable to other places.

Increasing access to insurance

While the initial focus for many pathfinders was on increasing household and business access to flood insurance, the relatively long timeframe for the joint process between Government and the insurance industry to put in place the Flood Re scheme meant that opportunities in this area were limited. Nevertheless, two pathfinders (Cornwall and Warwickshire) did develop relationships with local insurance brokers with a view to securing better cover and terms for residents in at risk areas. Cornwall was successful in getting an insurance broker to provide cover for local flood wardens, thus creating an important financial safety net in the case of accident or injury.

Once the Flood Re scheme is in place, further work will need to be done at a national or LLFA level to look at ways of promoting the uptake of insurance as part of programmes to increase community flood resilience.

Enhancing business continuity in at-risk communities

The 2013 – 2014 flooding brought home the way that flooding can have indirect as well as direct impacts on local businesses and that these impacts in turn make it harder for local communities to get back to normal, as people may find themselves out of work or local suppliers see their markets shrink. Seven pathfinders undertook measures to increase business flood resilience, recognising that this could make a significant contribution community financial resilience in the case of a flood event. Overall, few of the pathfinders achieved improvements in this area, with notable exceptions in Blackburn with Darwen (where 710 small business got their own flood plans) and Calderdale (35 businesses signed up for Environment Agency flood warnings and 23 businesses got grants to implement flood improvements in their premises).

Local authorities are often not best-placed to gain the trust of businesses in the area, because of their multiple roles in terms of enforcing environmental health and other regulations as well as imposing rates and other charges. Some of the most successful work carried out with businesses was led by independent, non-governmental or charitable institutions. This kind of approach lends itself to being transferred to other places, especially where the businesses involved can link up directly and find opportunities for learning from each other.

Property-level protection and financial benefits

Most pathfinders found that getting homeowners to implement PLP measures, even where homeowners could access grants to cover the survey stage and additional advice and support on getting the measures installed. Where PLP measures have been installed, these have not yet been tested as there hasn’t been a flood event. But some of the most successful cases (for example, Calderdale and Liverpool) have emphasised the synergies and multiple benefits to be obtained by making changes to the home designed to keep out flooding. Measures such as flood resistance doors and windows not only keep water out, they are also good for keeping heat in the home and so can lead to savings of energy bills.

Some pathfinder teams were concerned that PLP might begin to be seen as a measure that can be taken in isolation. They were quick to point out that PLP is 'only part of the puzzle', and needs to be accompanies by measures to reduce the likelihood of flooding (for example by preventing blockages of drains and culverts), flood warnings and other community-level initiatives.

What has been achieved that could not have happened without the scheme?

There are several key achievements that could not have happened without the scheme.

Firstly, whilst some of the pathfinder areas did have activity around community resilience clearly on their agenda, a number of them did not and it is a real achievement that in those places groups have been developed, awareness raised and institutional links forged.

Secondly, because the focus of the pathfinder scheme was on community resilience and had a focus on flood risk management which put people at the centre much was achieved in the areas of community engagement, flood volunteering and governance. This emphasis on people and communities in flood risk management is unusual. Typically, the emphasis is on infrastructure and physical solutions to flooding which may involve people and communities but don't start with them. Not only has the scheme been successful in building significant social capital across the pathfinder areas it has shown the value of community-led actions in ways that could be used in relation to large infrastructure projects.

Thirdly, linked to the second point, there has been a step change in terms of knowledge, tools and skills in relation to improving community resilience to flood risk. All the pathfinders have developed to varying degree materials, toolkits, videos and leaflets to explain flooding, raise awareness, and encourage actions. Many of those involved in the pathfinders both staff and members of communities have learnt new skills around volunteering, working in partnership and engaging with members of the public. The capacity building that has happened within the National Flood Forum would not have happened without the pathfinder scheme. It now has a firm base across England from which to support communities at risk of flooding. The development of flood volunteer training that can be used at the community level throughout England is also an important achievement for the pathfinder scheme as a whole. Whilst the course was already under development in Cornwall the pathfinder scheme has enabled that to be shared across the pathfinders and it provides a valuable resource for the future.

Fourthly, all pathfinders commented on the benefits to their projects derived from multi-agency meetings and the interlinking of projects, partners and agendas that have been stimulated by the scheme, such as Liverpool's work with BRE, the Joseph Rowntree Foundation, Southampton University and STAR-FLOOD. Other pathfinder project managers concurred:

*'Without partners coming together it would not have been as good.' (*Interviewee 2PM)

'…We had some Catchment money for rain gardens but that linkage wouldn't have happened if the pathfinder hadn't have been there.' (Interviewee 13PM)

Finally, the impacts of the projects have been seen to catalyse shared agendas and local networks, such as those developing between flood groups in Cornwall, Devon, Warwickshire and West Sussex.

Unexpected outcomes

One of the main unexpected outcomes of the project has been the emergence of new flood groups outside the project area: this was seen both in Warwickshire and in Chesham. This seems to reflect the application of learning on the part of project staff working in the local authority, as well as their appreciation of the benefits of working with organised community groups.

This experience in two separate pathfinders suggests that the focus on developing community resilience through local flood groups is one that is easily transferable. Indeed, the NFF has been developing a wealth of experience of setting up flood groups in different authorities and parts of the country.

Delivering sustained improvements that can be applied in other areas

The pathfinder scheme has delivered improvements that could be applied in other areas of the UK. It is still quite early to say how far the improvements will be sustained, but many of them are being given support going forward which should improve the likelihood of success.

In terms of process, the model of community engagement that starts with the needs of the community, uses skilled engagement staff and has a model of empowerment and participation within it is one that could be applied in other areas. The results may look different in different areas as they do across the pathfinders but that would be the mark of success in many ways, as the evidence from the evaluation is clear that "one size does not fit all". This approach developed by the NFF is one that they used predominantly when going into communities after floods, but it has been adapted largely with success to work in areas where it has not flooded.

A further aspect that could be applied in other areas where there are a number of flood action groups who all want to interact with local authorities is the model of a network of groups (as in West Sussex) or a forum of groups and organisations (as in Cornwall). This is a new level of governance which gives voice to communities at risk of flooding on a larger scale than has previously happened.

With respect to infrastructure, what is clear is that “pieces of kit” (e.g. PLP, flood stores) are not enough on their own – it is vital to have them as part of a wider community resilience building process that develops relationships as well in order for them to be effectively managed and maintained. However, they do provide useful focus for groups to form around and for bringing together authorities, agencies and citizens. The pathfinder scheme provides valuable learning on the issues around PLP, how to improve take up by members of the community, which could be applied in other areas where PLP is an appropriate flood risk resilience measure. In terms of a practical project that could be applied to other areas, the Cornwall leaf litter project is one that has potential to work elsewhere.

Clearly, the training for flood volunteers developed by Cornwall and Northampton are ways in which learning can be transferred to other areas of the UK. However, again the context in which that training is offered is going to be important in terms of how successful it might be. Interestingly, in Cornwall there were already quite a number of flood volunteers together with the Cornwall Community Flood Forum in place before the training was developed, which meant there was an existing audience for the initial training and also support for those who might want to be trained. Further in both Cornwall and Northampton the training was one aspect of the community resilience package aimed at members of the community.

Reflections on the methodological approach

In terms of the methodological approach taken to the evaluation there are a number of key issues. Firstly, the aim at the outset was to have both quantitative and qualitative data, with a specific focus on indicators for each of the resilience categories, and to collect data at the household and community level. To do this the indicators developed by Cutter *et al* (2010) were adapted to be relevant to flood risk and collected at the level of the “area of influence” for each pathfinder. In addition, a household survey was developed for each of the pathfinders to use to collect baseline data from residents in their areas. The aim was to collect data as baseline and then at the end of Year 2 to be able to monitor change over time. Whilst some of the indicators would not change over the time some of them did (e.g. numbers of flood wardens), which was useful. However, some revisions to the indicators could make them a more relevant set for future research.

In terms of the household data there was too much variability in the collection of the data for it to be as useful at the scheme-level as had been hoped. Having the survey administered through the evaluation team rather than at the local level could have improved its efficacy but that would have been an extra resource. The pathfinder highlights the role social research experience within teams that are carrying out evaluations as some of the pathfinders found it a challenge to carry out the survey. However, for individual pathfinders (e.g. Calderdale) however, they showed how it could be used to measure outcomes and integrated it well into their final reports. The survey itself with the questions provides a useful resource for further research. The qualitative interview data together with

the cases studies and the written reports from the pathfinders have provided a vast amount of valuable information which has been drawn upon through the project.

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Acronyms

AGMA:	Association of Greater Manchester Authorities
CCFF:	Cornwall Community Flood Forum
CEP:	Community emergency plan
DEFRA:	Department for Environment, Food and Rural Affairs
DECC:	Department of Energy and Climate Change
JFAG:	Junior Flood group
KPIs:	Key Performance Indicators
LA:	Local authority
LLFA:	Lead Local Flood Authority
NFF:	National Flood Forum
NGO:	Non-governmental organisation
NWRFCC:	North West Regional Flood and Coastal Committee
PLP:	Property level protection
REA:	Rapid Evidence Assessment
VCO:	Voluntary and community organisations
WSCC:	West Sussex County Council
WSFAFG:	West Sussex Flood Action Group Forum
WSSFRMB:	West Sussex Strategic Flood Risk Management Board
WP:	Work Package

Glossary

Activity: What is delivered by the pathfinder to recipients in the community. For example, provision of awareness raising sessions, grab bags, etc.

Community: There are many interpretation of the word 'community'. Here, we are defining communities through their geography/physical location.

Community capital: This category focuses on the existing networks and relationships within the local area e.g. knowing neighbours, informal help given/received, number of community groups belonged to, etc. Evidence suggests this is the 'glue' that keeps communities together and provides the foundations upon which community flood resilience can be built.

Community resilience: Communities (social, spatial, cognitive) working with local resources (information, social capital, economic development, and community competence) alongside local expertise (e.g. local emergency planners, voluntary sector, local responders) to help themselves and others to prepare and respond to, and to recover from emergencies, in ways that sustain an acceptable level of community functioning (Twigger-Ross *et al*., 2011: 11)

Economic resilience: This category focuses on t hose variables which give an indication of economic resilience (e.g. employment status, home ownership, insurance cover and levels of deprivation). Evidence shows that having greater economic resources can increase resilience to flooding.

Financial resilience: Financial resilience is the ability to access the financial resources needed to prepare for and recover from the impacts of flooding.

Flood group: The term 'flood group' covers all kinds of community groups whose purpose is to improve the community's ability to prepare for and respond to flooding. The pathfinders use different names for these groups. For example, community flood group, flood action group (FAG), etc.

Governance: This is defined as the institutions, bodies or organisations involved in decision-making processes together with the structures and norms between them. Increasingly it is more than just 'government' and is likely to consist of a wider range of formal and informal bodies (for example, flood NGOS, community flood groups).

Infrastructure resilience: This category focuses on type of housing together with any actions people might have taken to increase their household's resilience to flooding.

Input: Public, private and voluntary sector resources required to achieve the policy objectives e.g. resources used to deliver the pathfinder(s)

Institutional resilience: The category is focused on what institutional arrangements and experience there is within the community relating to flooding. This means individual engagement with local institutional arrangements for flood resilience, views on governance of flood resilience and flood experience. For example, membership of flood groups, signed up to Flood Warning Direct (FWD), responsibility for flood protection, experience of flooding, etc.

Legacy: Changes that have arisen through the pathfinder project that remain after the pathfinder project has ended. For example, installed PLP measures, flood information booklets, flood groups, governance structures and processes, new partnership working, policy changes etc.

Output: The result of activities undertaken by a pathfinder. For example, the number of people trained, the number of people receiving grab bags, etc.

Outcome: The change that has occurred as a result of activities undertaken by a pathfinder. For example, the number of people with increased flood awareness.

Social resilience: This broadly covers demographic variables (for example, age, number of people in household, disability etc.). Some of these are characteristics which have been shown to increase vulnerability to flooding and so it is important to measure those specifically (for example, disability). It also includes connectivity in terms of Internet and mobile phones.