



West Yorkshire Flood Innovation Programme – Roadmap

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West Yorkshire Flood Innovation Programme Roadmap.

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Foreword

Councillor Dr Jane Scullion, Deputy Leader of Calderdale Council and Chair of West Yorkshire Flood Risk Partnership

I am writing this foreword as a councillor but, perhaps more importantly, as someone who has been regularly flooded and is passionate about these issues, professionally and personally. We all know that the climate is changing. We also know that there is no one solution to the problems. And that is why the West Yorkshire FLIP programme is so important.



WY FLIP is about increasing the resilience of our region to climate change through a variety of strategies, working across sectors and pulling in new ideas about how we can work together in the future. We are interested in integrated water management solutions (IWMS), nature-based solutions (NBS), better property flood resilience (PFR), enhanced flood warning systems (EFWS) and finally helping the community and voluntary sector (CVS) to be better prepared and recover more quickly in flooding events. We'd like you to get involved, help us to identify new opportunities and share ideas.

We've also got four key principles and ways of working. Firstly we want to empower local communities to be flood aware and resilient. In Calderdale, there are flood buddy schemes, for example, where neighbours share keys and information about what needs to be moved upstairs if one of them is on holiday during a flood event. The second principle is about developing education and skills around flooding and climate change. Next is the need to transfer knowledge by building on existing partnerships, networks, peer to peer support, co-production, and innovation. The fantastic flood warden network here in West Yorkshire is a great example that should be more widely known. The final principle is the importance of monitoring and evaluation of activities and outcomes: proving the case for future investment.

Please join us and help develop this important work.



Acknowledgements

First and foremost we would like to thank partners of the West Yorkshire Flood Innovation Programme for their contributions to the roadmap. Their discussions and insights form the content of this roadmap, and the direction of the programme.

We would like to thank the University of Leeds iCASP team for bringing their experience and expertise to the development and running of the consultation exercises.

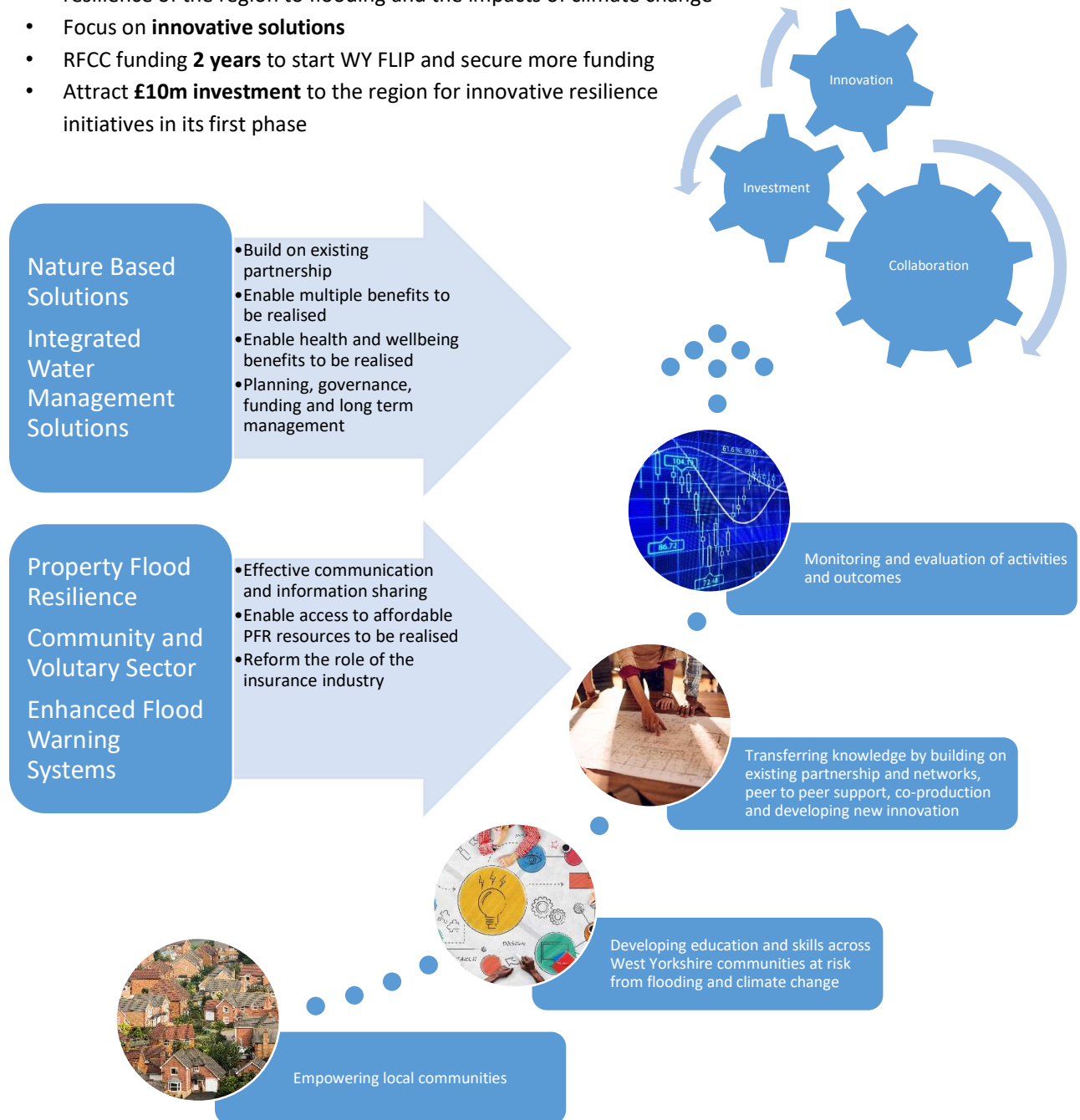
Thanks also go to Jonathan Moxon and Professor Joseph Holden and the West Yorkshire Flood Risk Managers for their support throughout the development of the roadmap and review of the final content.

Finally, we acknowledge Research England for providing the funding to develop this roadmap.



Non-Technical Summary

- **Collaborative programme**, local authorities and the Environment Agency working with academia, industry and third sector, to increase the resilience of the region to flooding and the impacts of climate change
- Focus on **innovative solutions**
- RFCC funding **2 years** to start WY FLIP and secure more funding
- Attract **£10m investment** to the region for innovative resilience initiatives in its first phase



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List of abbreviations

CVS	Community and voluntary sector
EA	Environment Agency
EFWS	Enhanced flood warning systems
EU	European Union
EWS	Early Warning System
FRM	Flood Risk Management
LAs	Local Authorities
LLFAs	Lead Local Flood Authorities
iCASP	Yorkshire Integrated Catchment Solutions Programme
IWMS	Integrated water management solutions
NBS	Nature based solutions
PFR	Property flood resilience
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
UK	United Kingdom
WYCA	West Yorkshire Combined Authority
WY FLIP	West Yorkshire Flood Innovation Programme
YDRT	Yorkshire Dales Rivers Trust
Yorkshire RFCC	Yorkshire Regional Flood and Coastal Committee

1. Purpose of this document

This roadmap presents the collaboratively created priorities, principal ways of working and milestones of the West Yorkshire Flood Innovation Programme (WY FLIP) – hereinafter referred to as the Programme. The aim of the roadmap is to:

1. Foster joint understanding and ownership of the aim and purpose of the Programme and its five priority themes
2. Identify opportunities, barriers and innovations around the five priority themes, including the scoping of shovel-ready and flagship projects
3. Set out a co-designed, joint vision for actions, milestones and future sustainability of the Programme
4. Communicate the joint vision and action plan of the Programme to engage further partners and potential funders

The roadmap was collaboratively created through consultation with partners from a wide range of sectors. The roadmap is aimed at practitioners, but not just from flood risk management backgrounds. The aim is to reach professionals from a variety of sectors, including but not limited to: infrastructure, health, finance, transport, planning, education and the community and voluntary sector.

2. Introduction

The WY FLIP is a collaborative, innovative programme to reduce the impact of flooding and climate change in West Yorkshire. The Programme was launched by the region's five lead local flood authorities, the University of Leeds and the Environment Agency (EA) to work at catchment levels across administrative boundaries.

This ambitious programme will explore new ways of working including bringing together people who do not normally work together. Collaboration is key and representatives outside of the flood risk and environment sectors will be involved including the finance and insurance sector, transport, education, technology and health to ensure a holistic approach and other benefits for our communities.

The programme was granted Yorkshire Regional Flood and Coastal Committee (RFCC) springboard funding for **2 years** to start the work and secure more funding. A Programme Board has been set up, currently chaired by Leeds City Council and iCASP and includes representatives from the five local authorities, the EA and the West Yorkshire Combined Authority (WYCA). The Programme links to the Yorkshire RFCC and the region's Catchment Partnerships through the established West Yorkshire Flood Risk Partnership, which plays a strategic role in the Programme.

This roadmap was created collaboratively through consultation with a wide range of partners in the region to set out the initial direction of the Programme.

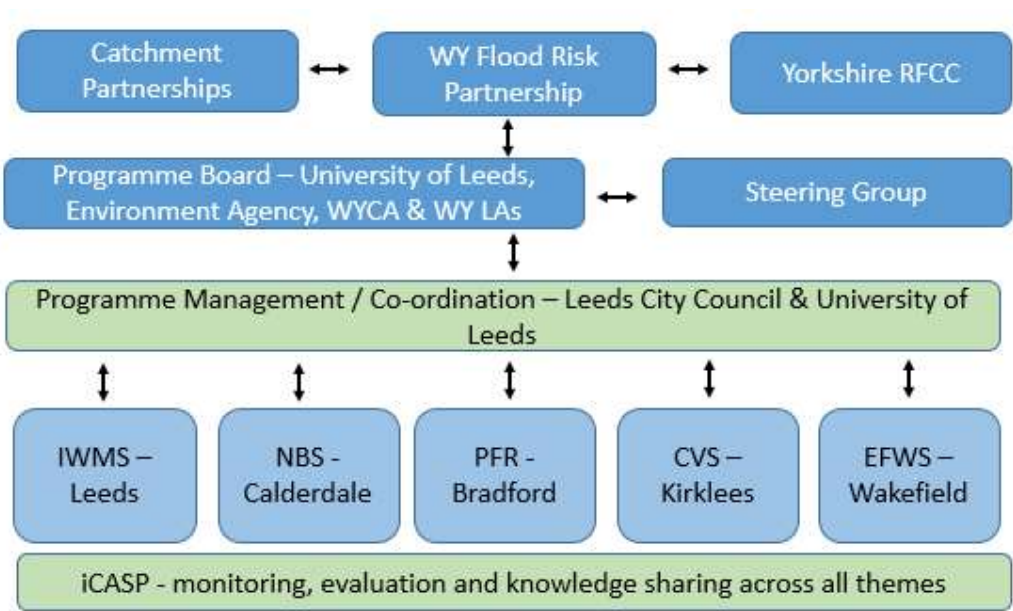


Figure 1: Programme Governance Structure

2.1 Regional context

West Yorkshire, in northern England, consists of five local authority areas; Bradford, Calderdale, Kirklees, Leeds and Wakefield, as shown in Figure 2. It covers four main river catchments, the Aire catchment, the Wharfe catchment, the Calder catchment and the Colne and Holme catchment.



Figure 2: The West Yorkshire Local authority areas

The Aire catchment contains the urban centres of Leeds and Bradford, and heavily urbanised middle reaches. The densely developed valley has significantly restricted the natural floodplain meaning many properties and businesses at risk of flooding. The Wharfe catchment is predominantly rural, flowing through open agricultural and Site of Special Scientific Interest (SSSI) designated land. There is a focus on water quality and enabling fish passage in the catchment.

The Calder catchment is generally urbanised with major concentrations of the population in the city of Huddersfield and the towns of Dewsbury, Halifax, Todmorden and Wakefield. The middle part of the catchment is characterised by steep valley sides with development in the restricted floodplain, making flood risk particularly severe (see, for example, Figure 3). There is important agricultural land within low-lying sections of the river Calder. The source of the Colne is in the Pennines, it flows through several small mill towns before joining the Calder.



Figure 3: Flooded homes and businesses in Hebden Bridge, Calderdale during the 2015 Boxing Day Floods (Source: BBC News <https://www.bbc.co.uk/news/uk-england-leeds-50850195>)

One of the largest impacts of climate change on communities and businesses in West Yorkshire is an increasing risk of flooding from rivers and surface water.

“

*There are over **3.5 million people** living in the Aire and Calder catchments alone, with Bradford, Leeds, Huddersfield and Halifax all falling within these catchments the risk of flooding to homes, businesses and critical infrastructure is significant. In West Yorkshire there are over **63,000 homes and more than 27,000 businesses at some degree of flood risk** and **7,385 homes and 4,698 businesses at a high risk of flooding**. There are also elements of the region's infrastructure network that may be susceptible to flood risk for example our transport network.*

”

West Yorkshire Place Narrative (WYCA, 2021)

To help address these risks the Programme brings together the five lead local flood authorities, the EA and a wide range of partners to fulfil WYCA's aim of working in partnership to provide enhanced flood resilience to homes, businesses and critical infrastructure by delivering catchment wide flood risk management infrastructure.

By seeking innovative, collaborative solutions the Programme will incorporate flood resilience in the WYCA priority areas of:

- Boosting productivity
- Tackling the climate emergency
- Enabling inclusive growth
- Delivery of 21st century transport
- Pledge to Net Zero

The programme will enable the strategic priorities and policy aspirations of the region to be realised by:

- ✓ putting into action the aspirations set out in the regional [Green and Blue Infrastructure Strategy](#);
- ✓ acting on the strong steer provided for the delivery of SuDS in the region's [sustainable drainage systems guidance](#);
- ✓ taking the steps and lessons learned from the [December 2016 flood review report](#) and its subsequent updates to improve the region's resilience and preparedness for the future, and
- ✓ supporting businesses and residents to expand their growth ambitions and receive the support needed to fulfil their potential as set out in the region's [strategic economic plan](#).

The programme will support the delivery of national policies and strategies set out in the Government's:

- ✓ [25 Year Environment Plan](#)
- ✓ [The Agriculture Act \(2020\)](#)
- ✓ [The Environment Act \(2021\)](#)
- ✓ [National Flood and Coastal Erosion Risk Management Strategy for England](#)

To deliver strategy aims and policies, partnership working and innovative solutions to flood risk management are required. To lay the collaborative and innovative foundations of the Programme, priority themes, aim, opportunities, challenges and actions set out in this roadmap were developed collaboratively by the Programme's partners.

3. Collaborative foundation of the roadmap

The Programme was developed in response to a demand from flood risk management practitioners for more collaborative working across West Yorkshire to enable the delivery of more innovative approaches to flood risk management.

To give practitioners ownership of the programme the content of the roadmap was collaboratively created through consultation with partners from a wide range of sectors including planning, public health, finance and the community and voluntary sector, as well as flood risk management authorities, academia and the private sector (summarised in Appendix A Table 2). Partners were consulted through a series of online workshops (Figure 4):

- **Workshop 1** (July 2021): core principles, programme aim and priority themes – consulted 32 partners
- **Workshop 2** (February 2022): motivations, theme aims and key mechanisms for collaboration and innovation – consulted 52 partners
- **Workshop 3** (March 2022): opportunities, challenges and tangible actions of the priority themes – consulted 45 partners

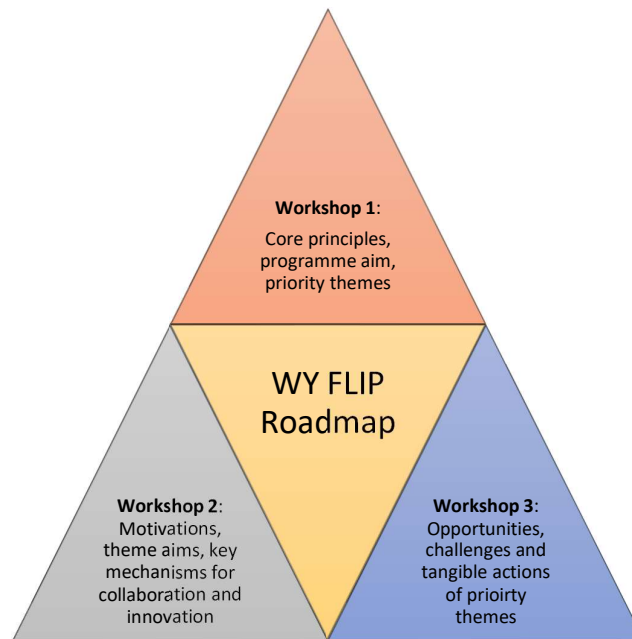


Figure 4: Workshops held to collaboratively set out the principles, aims and themes of the programme and identify its initial opportunities, challenges and tangible actions

The following content of the roadmap represents the aims, opportunities, challenges and tangible actions identified by its partners at this initial stage of the programme. The content should be taken as the starting point of the programme, it will be reviewed and updated to reflect the direction and progress of the programme as it develops.

4. Purpose of the Programme

The aim, key principles and priority themes set out in this section were collaboratively developed by the programme's partners in the initial stages of consultation. The themes are defined in more detail in Section 7 and the opportunities and challenges identified by partners under these themes are described in Sections 8 & 9.

4.1 Programme aim

The Programme aims to facilitate the region's efforts to increase resilience to flooding and the impacts of climate change. The programme aspires to foster collaborative working between local authorities, academia, industry and third sector to lead coordinated and innovative resilience initiatives. It is set to support its partners and their communities to develop and achieve strategic plans by pooling resources, networks, innovative solutions and expertise to achieve optimum returns on flood innovation investments.

In delivering the above, the Programme will facilitate both the use of new and existing flooding research at the University of Leeds and knowledge exchange between the University and policymakers. The Programme will develop collaborations that underpin evidence-based policy making and strongly influence new investments, ensuring they are research-led. The programme ultimately aims to attract significant funds to the region for innovative resilience initiatives to make the region a nationally recognised leader in delivering innovative flood resilience and partnership working.

4.2 Priority themes

The Programme addresses flood innovation through five priority themes (defined in detail in section 7):

1. Integrated water management solutions (IWMS),
2. Nature based solutions (NBS),
3. Property flood resilience (PFR),
4. Helping the community and voluntary sector (CVS) to be better prepared and recover more quickly
5. Enhanced flood warning systems (EFWS)

4.3 Overarching principles of the Programme

To ensure inclusive, equitable and sustainable flood resilience innovation, the Programme will foster key principles throughout its initiatives.

1. To sustain empowerment of local communities to engage, shape and co-deliver activities to build resilience across the 5 themes.
2. To embed knowledge transfer from the outset of activities to completion, using existing and new partnerships and networks, social media forums and community websites, measuring access, relevance, adoption and behaviour change.
3. To facilitate skills development and use of technology, through peer to peer learning between communities, delivery partners and local authorities, measuring training outputs, job creation and use of new initiatives and ways of doing things.
4. To monitor each area of activity and activity linkages using programme management tools, metrics developed with partners for each activity and independent evaluation of impact and learning by university colleagues.

By championing the overarching principles, collaboration and continuous learning and knowledge sharing will be embedded in the Programme's work. This will maximise returns on investments and efforts made to make and influence change.

4.4 Programme management, sustainability and timeline

The Programme has secured funding via the Yorkshire RFCC to resource the launch and initial phases of the Programme until March 2024.

4.4.1 Management:

During this time, the University of Leeds and Leeds City Council will jointly act to co-ordinate and manage the Programme and co-ordinator to promote and embed the Roadmap across West Yorkshire, establish a Programme identity and develop relationships with partners. In a practical sense, the iCASP team at the University of Leeds are taking on the main role, supported by the Flood Risk Manager from Leeds City Council. The Programme will be supported and guided by a Board with representatives

from each local authority area as well as the EA and WYCA. A steering group shall also be set up to enable partners from a range of organisations to feed into the direction and focus of the Programme (Figure 1).

If successful, this initial phase of the Programme will secure funding for a number of innovative resilience projects whilst also establishing itself as a valuable consortium within the region's decision-making landscape.

4.4.2 Sustainability:

To sustain and establish the Programme into the future, it will be crucial for partners across the region to have a clear understanding of the Programme aims, key themes, principles and ongoing activity. Initially work to achieve this will focus on the development of Roadmap outputs (slide pack, infographics, animations etc) that will be used to communicate and promote key messages about the Programme to a wide audience of partners and potential collaborators.

There are various sources of funding and models that the Programme could use to secure financial sustainability for management and coordination going forward these include but are not limited to: academic funding (knowledge translation, impact, policy, partnership), regional local levy funding, national government funding, cross sectoral funding.

4.4.3 Timelines:

The Programme has initially been funded by the RFCC until March 2024. The Board envisage that the Programme will gain enough funding to run for at least 6 years and during this time attract significant investment and funding for innovative resilience projects in the region. If successful, the Programme could continue to run for as long as it attracts funding and delivers meaningful outcomes.

5. How the Programme will achieve its aims and principles

The Programme will deliver its aims by facilitating collaborative inception and development of projects under each of the key themes. The programme will bring together and co-ordinate project partners from a wide range of sectors, embed the latest research, undertake independent academic monitoring and evaluation of activities and facilitate knowledge sharing. By providing programme management resource, efficiencies will be realised in bidding for funding. Moreover, such co-ordination will allow partners to work collaboratively to lobby for additional funding for the region and ensure opportunities are not missed.

5.1 Delivering tangible work

The tangible work the programme can deliver includes, but is not limited to:

Table 1: Examples of the types of tangible work the programme will deliver

Assets and infrastructure	Studies	Lobbying for policy change
<ul style="list-style-type: none"> ➤ Innovative interventions ➤ Identifying and promoting synergies between activities 	<ul style="list-style-type: none"> ➤ Pilot studies ➤ Feasibility studies ➤ Mapping studies ➤ Flood plan or engagement plan with defined roles 	<ul style="list-style-type: none"> ➤ Building the evidence base to support policy change

<p>(e.g. property flood and energy resilience)</p> <ul style="list-style-type: none"> ➤ Delivery mechanisms e.g. grant schemes 	<ul style="list-style-type: none"> ➤ Community outreach plan with multiple opportunities 	
<p>Knowledge sharing</p> <ul style="list-style-type: none"> ➤ Finding Lessons learned, building and sharing knowledge base of existing work under each theme ➤ Facilitating knowledge exchange (including community to community) ➤ Knowledge sharing repository ➤ Training ➤ Educational resources ➤ Outreach projects 	<p>New research</p> <ul style="list-style-type: none"> ➤ Developing the evidence base to underpin policies ➤ Quantifying multiple benefits of measures, including monetary values ➤ Testing existing metrics, such as Defra resilience metrics across different sectors 	<p>Building Relationships</p> <ul style="list-style-type: none"> ➤ Community engagement ➤ Partnership mapping and building relationships ➤ Network linking ideas between industries and communities

The programme will deliver through a fast pathway for opportunistic or shovel ready projects, and a slow pathway for more strategic, flagship projects. The ways of working identified by programme partners are summarised for opportunistic and strategic projects:

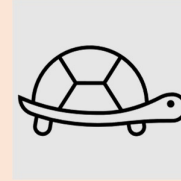


Opportunistic projects



- Provide resource to write bids and secure funding
- Make connections between partners
- Use its academic network to incorporate latest research and expertise
- Provide a library of existing work and lessons learned
- Facilitate meetings and workshops to bring together partners from different sectors
- Share information about funding opportunities amongst partners

Strategic projects



- Strategically build on existing relationships between partners, communities and landowners using existing networks and building new relationship where there are gaps
- Take a strategic approach to connect different parts of the catchment, e.g. linking upstream farmers with downstream communities
- Take a bottom up approach to community flood resilience. Build relationships with communities, allow communities to identify their own priorities and develop a joint vision for flood resilience.
- Identify and address knowledge gaps through feasibility studies, pilot studies and new research
- Provide the tools needed to make strategic decisions at a regional level, such as opportunity mapping or systems models
- Further the use of digital technology to manage flood resilience, for example by linking with existing smart city and Internet of Things agendas.

5.2 Partnership working

For the programme to deliver tangible work strong partnerships are key, the programme provides the resource to put in the time and effort needed to connect sectors with cross competing priorities. In particular, for the delivery of both opportunistic and strategic components of the programme, partners have identified the importance of building relationships with four key groups:

- Communities
- Landowners and their tenants
- Developers, the insurance industry and other sectors who are not primarily involved with FRM
- Private partnerships

By engaging with a wide range of sectors the programme will facilitate collaboration beyond organisational boundaries. The programme will build on, rather than compete with existing relationships by engaging in existing networks and using established connections where possible. It will promote working with clear expectations of its partners with defined roles and responsibilities. It will provide the resource to write collaborative bids across organisations, sectors and the region.

Letters of support

- ✓ The Programme will coordinate providing letters of support from partners for relevant funding bids. It will set out and use clear and rapid contact routes for efficient sign off.

The following process will be followed to collaboratively identify and develop funding proposals for the Programme. Additionally, the project scoping matrix tool provided in 'Appendix C – Project Scoping' will be used to embed cross-sectoral collaboration in the Programme's activities from the outset.

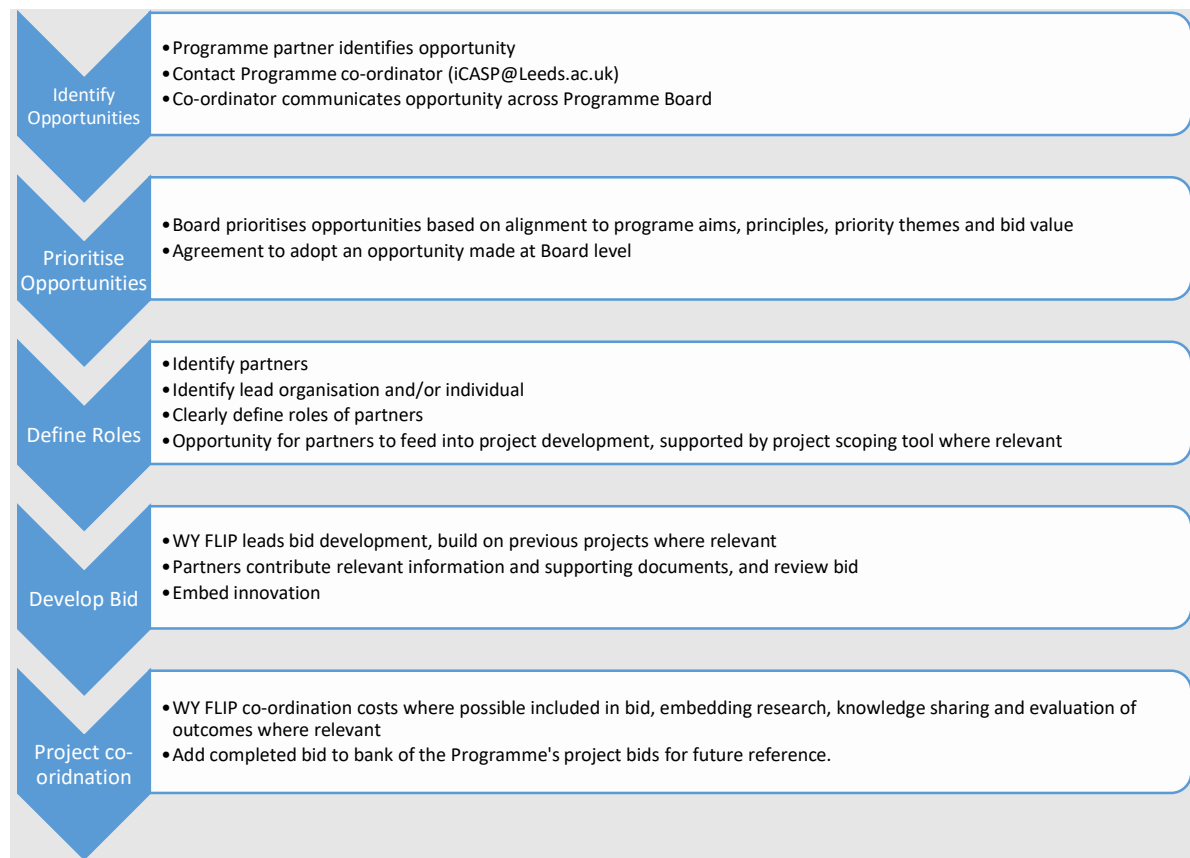


Figure 5: Steps to take in response to a project or funding opportunity

5.3 Accessing new funding streams

Partners identified that new ways of funding flood resilience measures are required to deliver innovative, collaborative projects. The following actions have been identified to enable the programme to access new funding streams. The programme's overall financial sustainability approach is set out in more detail in Section 4.4.

To access new funding streams the programme will:

- ✓ **Build on its partnerships**
 - Engage sectors which are not usually involved with flood risk management (FRM)
 - Engage with the green finance sector to develop opportunities for flood resilience
 - Develop pathways for joint public-private investment in flood resilience
- ✓ **Value the multiple benefits of interventions**
 - Strategically map opportunities for multiple benefits (e.g. air quality, place making, net-zero agenda) to access new funding sources
 - Support the development of methods to quantify multiple benefits in economic terms
 - Link upstream interventions with downstream benefits
- ✓ **Work in the policy and strategic context**
 - Align with local, regional and national strategic priorities beyond flood risk management
 - Challenge the way funding is currently distributed to support more collaborative and innovative projects
- ✓ **Collaboratively bid for funding**
 - Develop a template to investment funding to allow, for example, businesses to invest in NFM
 - Provide resource to develop bigger innovative bids.
 - Strategically bid for funding across the region

5.4 Knowledge sharing

It is recognised that local authorities and partners within West Yorkshire have a varied wealth of knowledge and expertise regarding resilience to climate change and flooding. A key component of the WY FLIP is to share knowledge and best practise across the key themes and principles of the Programme. We intend to capitalise on the collaborative, multi-organisational nature of the Programme to learn from each other and develop the resilience of the region together in partnership. It is recognised that sharing knowledge throughout the programme would be valuable at a range of scales:

- City council level (Inter/intra)
- West Yorkshire level
- United Kingdom/England

Partners recognise the importance of collaborative learning but highlight that it does not happen unless there is a mechanism in place to do so. iCASP at the University of Leeds will play a key role in facilitating knowledge sharing across the programme. Our approach to knowledge sharing will focus on:

- Sharing local community and voluntary expertise;
- Building on best practice and existing networks to ensure peer-peer learning;
- Linking to West Yorkshire Combined Authority sub-regional work on flood resilience
- Utilising and integrating the latest academic research
- Monitoring and evaluating the activity of the programme to facilitate knowledge sharing

The Programme will consider and utilise multiple mechanisms for knowledge sharing including:

- Regular updates to partners of key activities
- Periodic lesson learnt documents
- Updating at regional partnership forums
- Annual conference event
- Establish working groups for the five priority themes to link to academia
- Facilitate workshops and working meetings which bring together partners to work on specific actions

5.5 Monitoring and evaluation

iCASP at the University of Leeds will lead on the monitoring and evaluation of the Programme. This will provide and maintain a catalogue of activities including successes and lessons learnt. This catalogue will be used to facilitate knowledge exchange and actively support the development of the Programme by supplying supporting evidence for funding bids, business cases and proposals etc.

6. Partnership mapping

Identifying and building effective partnerships is a key to realise the goals of the Programme Roadmap due to the cross sectoral nature of the innovation themes and potential projects that the Programme plans to lead in West Yorkshire. Besides, building effective partnerships ensure integrated and sustainable delivery of relevant projects and interventions to the ownership and uptake of the concerned communities. Partnerships in any development programme involve a wide array of cross-sectoral partners to consider including policy makers, legislators, regulators, private companies, consultants, and wider stakeholders such as local authorities, planners, architects, highway authorities and farmers). Cross-sector partnerships foster innovative approaches to tackle development issues such as flood management, offer a pool of resources, competencies, and capacities, offer dynamic networks and engagement prospects. Based on the engagement throughout the process of establishing the WY FLIP including the three consultation workshops with partners (refer to appendix A for the full list of attendants. Figure 6 provides a list of the current partners of the programme organised thematically. This list remains active and open for potential future partners to engage with the programme.

West Yorkshire Flood Innovation Programme Partners

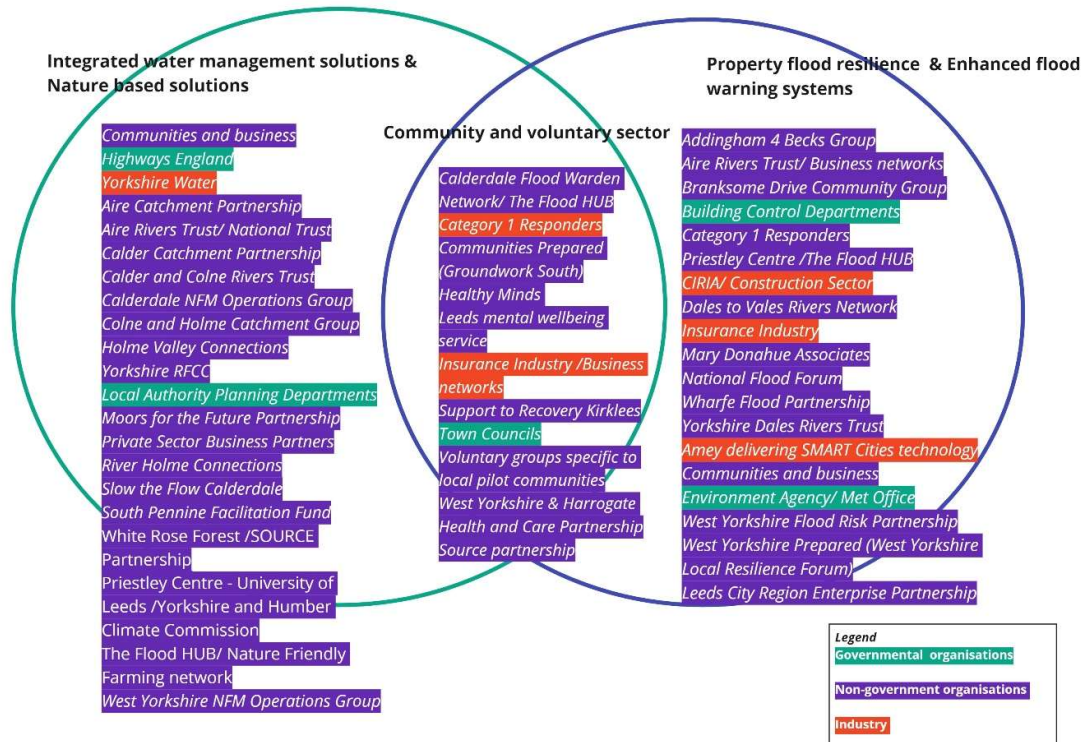


Figure 6: Thematic distribution of the current partners of the WY FLIP

7. Programme priority themes

The five priority themes of the Programme, set out in Section 4.2, aim to reduce the impact of fluvial, surface water and groundwater flooding in the region. Firstly, the collaboratively developed definition and vision for each theme is set out in this section. Secondly, the opportunities and challenges identified by the Programme partners are described in two sections. The first covers the themes of Integrated Water Management Solutions (IWMS), Natural Flood Management (NFM) and Nature Based Solutions (NBS), the second covers the themes of Property Flood Resilience (PFR), the Community and Voluntary Sector (CVS) and Enhanced Flood Warning Systems (EFWS).

7.1 Integrated water management solutions

Definition:

IWMS provide holistic ways to address impacts of climate change, urbanisation and other water challenges at both a regional and local level. Although IWMS can mean different things to different people, the definition of the Global Water Partnership (2000) is adopted here. This defines IWMS as “Promoting the coordinated development and management of water, land, and related resources to maximise the economic and social benefits while minimising impacts on the environment”. For example, the management of surface water using Sustainable Drainage Systems

Vision:

Resilience means taking a catchment based approach to water management to reduce pollution from run off, damage to soil health, and loss of wildlife and habitat. Farmers and communities to work together to reduce the impact of flooding and avoid adverse effects of agricultural and urban flooding on water quality. Solutions will showcase how all aspects of water management are related and pioneer solutions which acknowledge this, such as providing improved habitat alongside wetland areas. Sustainable Drainage Systems (SuDS) will form a key part of this theme, this programme will look to drive progress to these becoming much more mainstream and widespread.

Theme lead: Leeds City Council

7.2 Nature based solutions or Natural Flood Management

Definition:

Nature based Solutions are inspired and supported by nature. They protect, sustainably manage and restore natural or modified ecosystems to deliver cost-effective social, environmental and economic benefits whilst helping to build resilience. A nature based solution for risk reduction and adaptation in river catchments is Natural Flood Management, also referred to as working with natural processes to reduce flood risk. Natural flood management measures range from restoring river bends to increasing the water holding capacity of soils or strategically planting trees. Alongside reducing flood risk, natural flood management can achieve multiple benefits by restoring habitats, improving water quality and making catchments more resilient to the impacts of climate change.

Vision:

Working with nature for better flood and ecosystem resilience, better recognition and communication of the benefits of NBS for multiple partners and incorporating NFM in existing activities, such as creation of new woodlands. The use of Natural Flood Management and Nature Based Solutions is still quite limited across the region compared to its potential. This programme will look to drive a scaling up of programmes that include this work, developing solutions and answering questions that currently represent gaps around areas relating to planning, governance and long-term funding and management.

Theme lead: Calderdale Metropolitan Borough Council

7.3 Property flood resilience – measures that reduce the risk of flood damage to properties

Definition:

After (Yorkshire Flood Resilience, 2022) Property Flood Resilience (PFR) refers to measures that reduce the risk of flood damage to properties, speed up recovery and help people to return to their properties quicker after flooding. It includes measures which make a property more flood resistant and measures which improve flood recoverability and resilience. Measures which make a property more flood resistant prevent, delay or reduce the amount of water which enters the property. Measures which improve the flood recoverability of a property minimise the damage caused by floodwater once it has entered a property by using materials, products and construction techniques which reduce the likelihood of permanent damage to the property.

Vision:

We will support people, communities and partners to be equipped to proactively limit flood impacts and recover better by increasing overall awareness of available resilience measures and resistance

products and awareness of how and when it should be used and maintained to maximise its efficiency. This theme will focus on communities that suffer frequent flooding. We will pilot techniques to use PFR solutions alongside training, engagement and support across the community to provide long term, sustainable benefits. A number of gaps have been identified and areas where current approaches to PFR installations do not offer long term success. This theme will look at projects that will work different to offer solutions to these issues.

Theme lead: Bradford Metropolitan District Council

7.4 Helping the community and voluntary sector to be better prepared and recover more quickly

Definition:

Community engagement is paramount to flood risk mitigation, preparedness and resilience (Kseniia Puzyreva, 2022). Community involvement in flood risk management includes developing and sharing good practice in risk management, training community volunteers so that they can raise awareness of flood risk in their community, and helping the community to prepare flood action plans. Organisations that represent communities who live or work in areas at risk of flooding, such as local flood action groups, provide valuable, trusted channels for local authorities to share information, guidance and support with the community (local.gov.uk). Providing flood protection will allow vulnerable communities in flood risk areas to become more resilient to other social-economic issues.

Vision:

Empowered communities, with the skills, knowledge and resources to help prepare for, respond to and recover from flooding and other emergencies. We will improve communication and education for residents and businesses at flood risk to help them better understand their risk, how to get flood warnings, how to respond during a flood and how to recover more quickly. We will promote self-help groups to help the community to react to flood warnings. We will look to deliver improvements to both awareness and support around mental health in relation to flood and climate risks. Work in this theme will also focus on challenges related to insurance. We will aim to support a shift in the insurance industry towards building back better so that properties can be renovated in a more resilient way following a flood.

Theme lead: Kirklees Council

7.5 Enhanced flood warning systems

Definition:

A flood warning system increases community preparedness by predicting the likely timing, location and scale of a flood. It consists of four components (1) Knowledge of an area's flood risk; (2) a reliable forecast and warning service based on local monitoring; (3) A system for communicating and disseminating the flood risk; (4) community response capabilities (UNEP-DHI Partnership, UNEP-DTU, & CTCN, 2017). Together the four components improve community preparedness for floods by increasing understanding of the risks of a flood and informing appropriate response.

Vision:

The innovation in this theme will see the flood and resilience sectors working more closely to provide a higher standard of community led resilience by providing more support and training to empower communities. It will involve developing and supporting a network of community resilience champions. This theme will focus on using social media and the latest rainfall and flood

forecasting technologies, working with Universities and the Met Office, to make real time information available to incident managers and communities. It will help inform responses to surface water flooding – currently flood warnings and forecasting are focused on river and coastal flooding. We will look to develop new tools and technologies as well as platforms to share this information.

Theme lead: Wakefield Council

8. Opportunities and challenges of IWMS, NBS & NFM

The opportunities and challenges identified by Programme partners in the themes of Integrated Water Management Solutions (IWMS), Nature Based Solutions (NBS) and Natural Flood management (NFM) are set out in this section. The Programme partners have identified the key considerations to make progress in flood resilience innovation as follows.

8.1 Build on existing partnerships

IWMS and NBS require collaborative working between a range of partners, including flood risk managers, landowners and delivery partners, such as volunteers from the local community. Challenges include the cross-cutting nature of achieving multiple benefits, including practical issues such as sharing data and locations.

A lack of a shared terminology and language around NBS was identified as another challenge of cross-sector working because some terms can be unclear or divisive. A universal language for NBS would allow for easier sharing of information and increase productivity and transparency. On the ground partners in West Yorkshire already have established relationships and shared terminology with landowners (e.g. local rivers trust, land agents). This is a key strength of existing projects in West Yorkshire; the relationships and lessons learned by these partners will support the delivery of the Programme.

The Programme partners would therefore like to take a strategic, co-ordinated approach to use and enhance existing networks and partners and build on success without competing or undermining established relationships. This could make use of and build on established landowner relationships through Yorkshire Dales Rivers Trust (YDRT), Aire Rivers Trust, Calder & Colne Rivers Trust, land agents, and Aire and Calder Catchment Sensitive Farming officers who are already working on a co-ordinated approach. Where there are gaps in partnerships, the programme will learn from previous work to build new relationships. For example, the Programme will support the roll-out of existing successful collaborative schemes, such as Calderdale's NFM landowner grant scheme across the region.

Community engagement will form a key part of the programme. By involving communities from the outset of its projects the Programme will foster a sense of ownership, make use of valuable local knowledge, involve the community in volunteering and set up opportunities to collect data through citizen science. By setting up good lines of communication with communities joint understanding of the decisions made by flood risk management authorities can be fostered, particularly where the community has been part of the decision making process.

The Programme partners have identified schools and universities as opportunities for inter-generational community engagement. The Programme will aim to connect students and pupils to the

inspiring work in the region. The programme is already engaged with the Department for Education to deliver SuDS for schools across West Yorkshire.

- ✓ The programme will use and enhance existing networks and partners to build on success in the region
- ✓ To enhance partnership working the Programme will take a leading role in co-ordinating activities in the region and making links between new and existing programmes.
- ✓ The programme will empower communities by building relationships and engaging at the earliest possible stage

Examples of existing work are listed below, please use the hyperlinks to project websites for more information:

- [Canal Road Highway Scheme](#)
- [Calderdale landowner NFM grant scheme](#)
- [Broughton Sanctuary Nature Recovery Programme](#)
- [Upper Aire Project](#)
- [Aire Catchment Network](#)

8.2 Enable multiple benefits to be realised

NBS and IWMS are appealing because of their ability to deliver multiple benefits such as water quality, air quality and habitat improvements alongside flood risk management. However, partners identified that a funding bid led by a team or department usually has a primary intended benefit which means these multiple benefits can become secondary to the main aim. Multiple benefits can dilute the primary aim by spreading the resource or focus to include the secondary benefits. This can make the project more difficult to fund if the funding source is aimed at the primary benefit. Furthermore, delivery of projects with multiple benefits can be challenging because there are trade-offs between multiple benefits which means who or what receives a benefit, and when, has to be prioritised, which can lead to conflict.

However, by taking opportunities to deliver multiple benefits, funding efficiencies can be realised. For example, activities which support the conversion of driveways for electric vehicle charging could require the incorporation of SuDS. To support decision making, and enable funding efficiencies to be realised in such a complex system strategic, oversight is needed. The Programme will support the delivery of projects with multiple benefits by developing the tools needed to take a strategic approach across the region. Partners have identified three mechanisms by which these challenges could be addressed: systems models, opportunity mapping for multiple benefits and strengthening business cases to better account for multiple benefits.

By taking a strategic, cross-sector collaborative approach the programme will be able to access different funding streams. By mapping opportunities, NFM and SuDS can be integrated with opportunities from different sectors such as roads and highways, parks and recreation, water resource management and public health, as well as traditional engineered flood defence schemes. For example,

net biodiversity gain from developments, such as wetlands, could be strategically placed in areas where they will have NFM benefits. Such a mapping approach would make use of existing GIS datasets, such as the health and wellbeing datasets held by the Catchment Based Approach, surface water flood maps, local plan maps and the Environment Agency's open source NFM opportunity maps. The programme could learn from and build on experience of Calderdale's NFM opportunity maps and share data across organisations on a central database.

Systems models are useful to link upstream source areas to downstream communities or businesses at risk. The approach could therefore be used to better understand where to make interventions, where the benefits spread to, and who receives the benefits. They can also be used to analyse interactions within a system and assess synergies and trade-offs between interventions. By taking a systems approach across the region the Programme could provide a powerful decision making tool to maximise outputs at a strategic level.

NFM/NBS and IWMS interventions require the multiple benefits they provide to be valued over other land-uses. Competing interests for land-use include development and agriculture and there are challenges around how different land uses are valued. The programme will aim to strengthen the business case for NBS/NFM and IWMS by developing tools to better account for its multiple benefits. The programme will build on and learn from the work of the Interreg North Sea Region Blue Green Infrastructures through Social Innovation (BEGIN) programme, of which Bradford is a target city. BEGIN involved stakeholders in a value-based decision making process to overcome current barriers to implementing blue-green infrastructure.

- ✓ The programme will provide strategic oversight to allow multiple benefits to be realised.
- ✓ The programme will support decision making and find cross-sectoral funding opportunities by:
 - taking a systems approach
 - mapping opportunities across sectors
 - strengthening the business case for multiple benefits.

Examples of existing work are listed below, please use the hyperlinks to project websites for more information:

- [Calderdale NFM Opportunity maps](#)
- [BEGIN programme](#)
- [CIRIA multiple benefits estimation tool \(B£ST\)](#)

8.3 Enable health and wellbeing benefits of NBS to be realised

We will collaborate with the health sector to create opportunities and provide infrastructure to enable mental health and wellbeing benefits of NBS/NFM and SuDS to be realised. Opportunities for health and wellbeing and NBS include the benefits of volunteering, providing communities with a sense of ownership and empowerment, social prescribing, improving air quality and actively building in recreational activities, such as rights of way in forests. With its principle of evaluating and monitoring

activities the programme could help to support developing an evidence base of the health and wellbeing benefits of NBS.

Partners identified a collaboration opportunity to take into account the impact of flooding on [health and wellbeing](#) in the sustainable food systems theme of the [Bradford food strategy](#).

- ✓ The programme will collaborate with the health sector to create opportunities and provide infrastructure to enable mental health and wellbeing benefits of NBS/NFM and SuDS to be realised.

8.4 Planning, governance, long term funding and management of IWMS and NBS

There are not yet established procedures to account for the long term maintenance and governance of NBS/NFM and SuDS. This has been an ongoing problem for the uptake of SuDS, for which, according to (Melville-Shreeve, et al., 2018) there is:

- weak regulation of design and construction,
- need for clear legal framework for ownership and maintenance
- need for a local authority led single adoption method
- strengthening policy to make SuDS obligatory

which are problems also for NBS/NFM. The Programme partners identified gaps around areas relating to planning, consenting, governance and long- term funding and management of NBS/NFM, including, for example, consideration of change of ownership. The programme will aim to help deliver balanced, flexible solutions to these problems. By working collaboratively across sectors it will consider the maintenance and management of NBS holistically. For example, it will work with partners to manage leaf litter and storm damage which may result from tree planting activities. The programme will support activities which showcase the effective use of SuDS, evidence their efficacy and demonstrate ways of overcoming challenges related to long-term adoption and maintenance.

One way in which the programme aims to increase the uptake of NBS/NFM is by streamlining consenting requirements for works in ordinary watercourses across West Yorkshire. The approach will give a better understanding of the risks of NBS, which is required to avoid inadvertently exposing communities to increased risks. Collaboration between the consenting authorities would allow a consistent, risk based approach to be developed for the region. Furthermore, the programme aims to explore development of long-term governance and maintenance of NBS through a not for profit company. The company will be set up to sit alongside national agri-environmental schemes and work with private sector partners and communities.

A further policy-related challenge is the uncertainty around the move from the EU's Common Agricultural Policy to the UK's Environmental Land Management Scheme (ELMS) following the UK's exit from the EU. Certainty is needed around ELMS to ensure landowners are fairly compensated for implementing and maintaining NBS on their land. Currently it is unclear whether implementing NBS will affect a landowner's eligibility for funding, especially under ELMS.

- ✓ The programme will review and address gaps around:
 - Regulation for design and construction of NBS
 - Ownership and maintenance of NBS
 - Planning and Consenting requirements of NBS
 - ELMS

Existing work

- [Calderdale landowner NFM grant scheme](#)
- [Leeds City Region Sustainable Drainage Systems Guidance](#)

9. Opportunities and challenges of PFR, CVS & EFWS

Increasing communities' flood resilience is approached by the Programme through three key themes: Property flood resilience (PFR), Helping the community and voluntary sector (CVS) to be better prepared and recover more quickly and Enhanced flood warning systems (EFWS). The collaborative consultations with the Programme partners have identified the key considerations to make progress in flood resilience innovation in the three themes as follows.

9.1 Effective communication and information sharing

As community awareness is key to improving resilience, it is crucial to foster diverse a platform to communicate and share flood-related messages and early warning in case of flooding. Diverse platforms including social media outlets, mobile applications (emergency alert systems), government official websites, radio and television channels would broaden the reach to people who are not covered by the current platforms. It is important to understand the preferences of the community in terms of its accessibility, reliability, and online engagement as well as benefiting from lessons learnt in past flood events. Utilising online engagement would also allow crowdsourcing flood-related information from the public to refine and improve the EFWS as well as other flood-related communication and planning in place. However, it is crucial to keep in mind that this channel would exclude non-users of social media and internet-based platforms such as older people.

Although the social media and online platforms offer wide reach and diverse forms to share and exchange flood-related information, it is also a space for misinformation, spread of worrying, scare mongering and fake news. Hence, social media is not the primary trusted information source for all users. Therefore, it is crucial to set an inclusive communication arrangement that limits misinformation, and ensures the spread of useful and practical message to help direct people toward better flood resilience resources and practices.

Existing work

- In the recent flooding event, a real time and immediate data related to the flood event happens in flood arena/event was provided through the EWS/live updates to help people prepare at household level/small and medium-sized enterprises (SME) to minimise flood risk and prepare for future events.
- Bradford University is currently developing a mobile application geared towards emergencies.
- The days, 30 ways Campaign: as part of 'September is preparedness month', the campaign encourages people across the UK to be more 'emergency-ready' by doing simple challenge each day throughout September. Although it raises awareness about emergency preparedness, it is crucial to promote a long-term preparedness instead of only raising awareness. For further information check their website:

<https://www.30days30waysuk.org.uk/about-us/>

9.2 Enable access to affordable PFR resources

Beside effective communication with the public, facilitating access to resources is vital to realise the programme's aim to increase flood resilience. Clear guidance for the public about accessing affordable PFR (e.g., relocate household's boiler to minimise its flooding damage) is particularly important since the affordability is a key barrier to taking flood resilience measures. The affordability issue is also an obstacle for SMEs who are severely impacted by flooding in their areas. Nevertheless, it was mentioned repeatedly by the Programme partners that PFR is household-specific and small businesses eventually found themselves excluded from accessing support. Hence, it is crucial to understand better the risks, vulnerabilities and needs of households, local charities and SMEs in order to be inclusive and provide comprehensive support to the affected population. The assessment should go beyond the physical properties as little is known about people's experiences and the hidden vulnerabilities associated with flood emergencies.

Another opportunity to provide assistance is to support communities, who are closely connected, to update their local plans to have a combined approach that increases the effectiveness of their resilience measures in place. For instance, engaging with their local authorities, public space and organisations (e.g., school, playground) in their areas to improve their flood resilience. In addition to promote collaborative contribution from communities (e.g., pooled funding) to help them invest in flood resilience improvements in their areas such as SuDS, help low-income households and SME pay for insurance premiums. Holistic local planning would also activate the role of flood wardens which might become ineffective when flood events are spaced in the long-term. Flood wardens can also be

connected to Beck Stewards who engage over a wider range of water-related issues and thus are able to offer guidance and support to flood wardens and ensure their role is activated in the long-term.

- ✓ The programme will enable affordable practice by providing necessary information and communication channels to access resources
- ✓ Promote coordination and collaboration between community members and relevant organisations to pool resources toward increase property resilience and coordinate their work

Existing work

- Property Flood Resilience: Stories from homes and businesses who have made adaptations to help them recover more quickly after a flood (<https://thefloodhub.co.uk/wp-content/uploads/2019/07/Property-Flood-Resilience-MDA-EA-Flood-Re.pdf>)

9.3 Reform the role of the insurance industry

Insurance coverage schemes for flooding is problematic for communities and SMEs as affordability is a challenge which highlights the inequality aspect of managing flood risks while there are no clear arrangements or government policies to help low income populations to receive reductions on premiums especially if they have PFR arrangements in place. To alleviate the increased rates for premiums, the government and insurers developed the Flood Re scheme in order to manage the costs for both insurance companies and most of their domestic customers (households). However, the scheme is not open to everyone (e.g., SMEs) and owners of properties at risk would still pay more for premiums. The Programme partners suggested that establishing a pooled funding from many sources would be helpful to build up insurance scheme for both households and SME customers. This would require government intervention to be sustained. Such large-scale initiatives would offer opportunities for big companies to act as an umbrella for the various insurance schemes given that the appropriate vision and incentives are in place

The Programme partners have repeatedly highlighted that lack of financial incentives for insurers to be involved and therefore there is a need to have dialogue with the insurance industry to address the risk, scale and economic case of covering floods. Perhaps a government-approved insurer would be a solution to scale and achieve economic gains from covering floods needed and hence keep the insurer interested. The scale aspect is crucial to activate the role of insurers since flooding is associated with loss of life and there is a need to have large numbers of partners for buy in and contribution including IWMS.

The Programme partners have also stressed the lack of transparency and public liability when it comes to data use and decision making within the insurance industry. For instance, community groups working on NBS to improve the wider community resilience to flooding are not able to access insurance for their work. Therefore, there is, especially if governmentally-funded, a need to maintain funding transparency for people to get sight of and access to funding. Hence, local government institutions should actively engage with the insurance services in their localities starting by working

with insurance specialists rather than just flood risk management teams to ensure ultimate returns insurance-wise for flood resilient properties and programmes.

Limited incentives for the insurance industry and other partners stems from limited evidence around the return on flood resilience investments (e.g., SuDS) to improve the conditions of properties and hence prompts insurance companies to cover flood risks. It is particularly important in order to generate such evidence to back and monetize (flood damage savings) the efforts of flood resilience groups to be translated into lower premiums. Generating evidence on flood resilience innovation solutions for insurance would encourage communities to take on these solutions to minimise their risks as well as access insurance schemes.

- ✓ The programme will promote effective collaboration with insurance industry by fostering dialogue between governmental organisations and the industry to ensure affordable access to premiums and ensure that small businesses are accommodated in such arrangements.
- ✓ Promote research and innovation toward better valuation of resilience measures towards insurance practice

Existing work

- Flood benefit scheme in Calderdale, the scheme offers emergency grants to local charities, households and businesses affected by flooding.
- The National flood forum provides insurance-related information that can be utilized to establish dialogue with insurers and home owners (for further information: <https://nationalfloodforum.org.uk/about-flooding/insurance/household-insurance/>)
- Catastrophe modelling of flood events by reinsurance companies, JBA risk management and others.
- Review and utilise current effective and best practice insurance arrangements in other countries such as The Netherlands, Malaysia and Australia.

10. Conclusion

West Yorkshire's local authorities, the Environment Agency, industry, academia and the third sector have come together in the West Yorkshire Flood Innovation Programme to increase the resilience of the region to flooding and the impacts of climate change. This roadmap sets out how the Programme will deliver its aims of working collaboratively to deliver innovative solutions and attract £10m of investment to the region, in its first phase, for innovative resilience initiatives, and much more in the longer term.

The roadmap was collaboratively created by the Programme partners through consultation over three workshops to foster ownership of its aims, actions and ways of working. It will be updated regularly to reflect the direction of the Programme and to represent the views of its partners as it continues to engage partners from a wide range of sectors.

The roadmap sets out the key opportunities and challenges for the region. In line with its overarching principles of empowering local communities, developing education and skills of communities at risk from flooding, knowledge sharing and monitoring of outcomes, this roadmap sets the foundations for the Programme to deliver tangible actions across its five priority themes.



11. References

- Kseniia Puzyreva, Z. H. (2022). Professionalization of community engagement in flood risk management: Insights from four European countries. *International Journal of Disaster Risk Reduction Volume 71*, 2212-4209.
- Melville-Shreeve, P., Cotterill, S., Grant, L., Arahuetes, A., Stovin, V., Farmani, R., & Butler, D. (2018). State of SuDS delivery in the United Kingdom. *Water and Environment Journal*, 9-16.
- UNEP-DHI Partnership, UNEP-DTU, & CTCN. (2017). *Climate change adaptation technologies for water: a practitioner's guide to adaptation technologies for increased water sector resilience*. CTCN publications.
- Yorkshire Flood Resilience. (2022). *Yorkshire Flood Resilience*. Retrieved from <https://yorkshirefloodresilience.co.uk/>



12. Appendix A – Sectors consulted to collaboratively develop the roadmap

Table 2: Programme Partners consulted to develop the roadmap

Sector	Representatives consulted
Flood risk management	The five WY LLFA's Environment Agency WYCA Private Sector Consultancies Private sector flood resilience specialists Academics
Environment, water and land management	Country Land and Business Association White Rose Forest Natural England Ecologists Academics Private Sector Consultancies Yorkshire Water Environment Agency Private sector environmental services specialists
Public health	NHS Trusts Local Councils
Planning	Local Authorities
Green finance Environmental economics	Academia
Third Sector	Local Rivers Trusts, Local Wildlife Trusts, National Trust Mental health charities Groundwork North Community action groups Flood Wardens Moors for the Future River Holme Connections Slow the Flow Calderdale Forestry Commission
Emergency Services and Emergency Planning	West Yorkshire Local Resilience Forum Local Councils
Infrastructure & Transport	Network Rail WYCA
Insurance Industry	We are seeking representatives from home and business insurance companies who operate in West Yorkshire
Developers	We are seeking representatives from residential and business property developers in West Yorkshire

13. Appendix B – Partnership Mapping

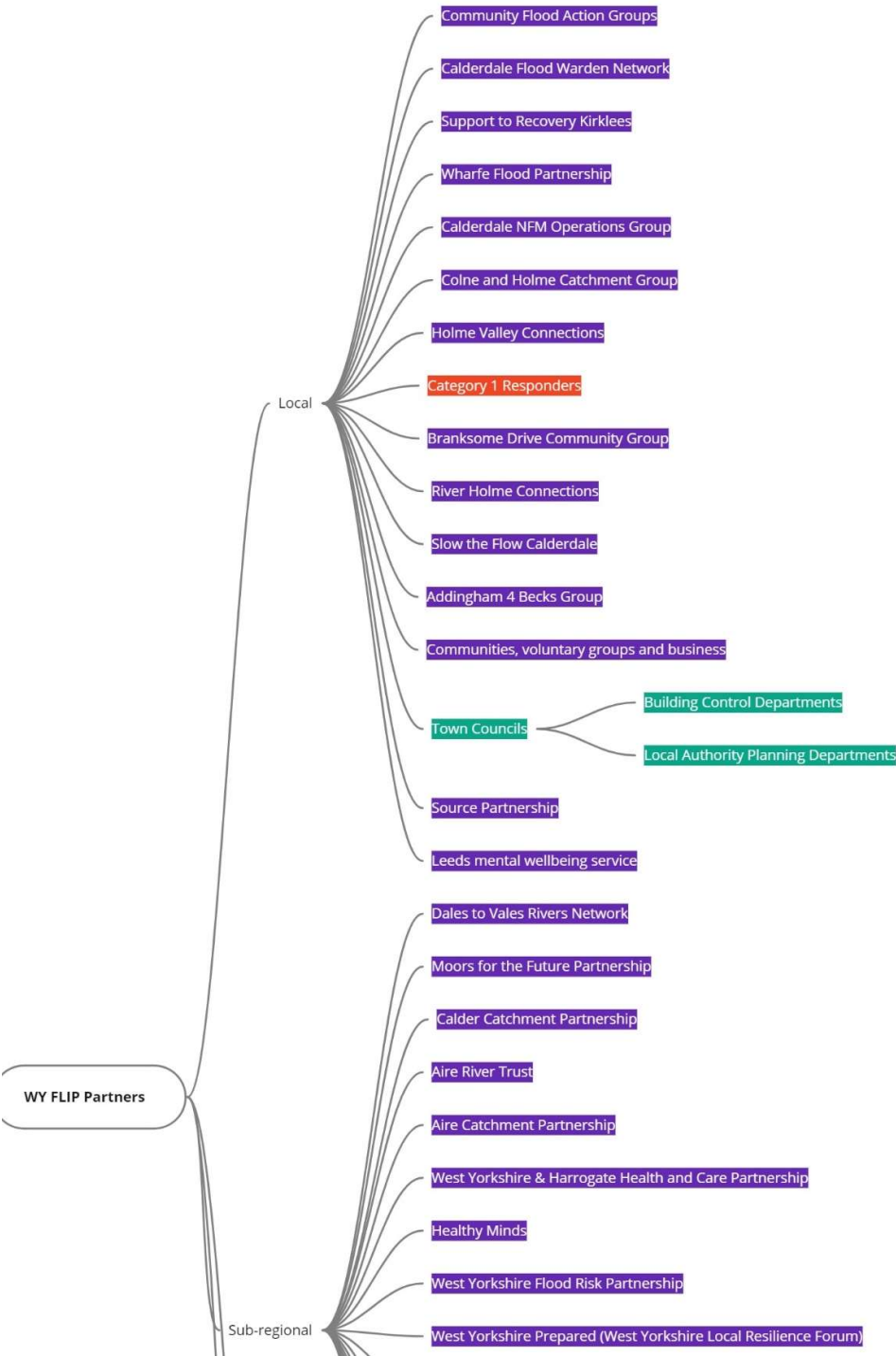
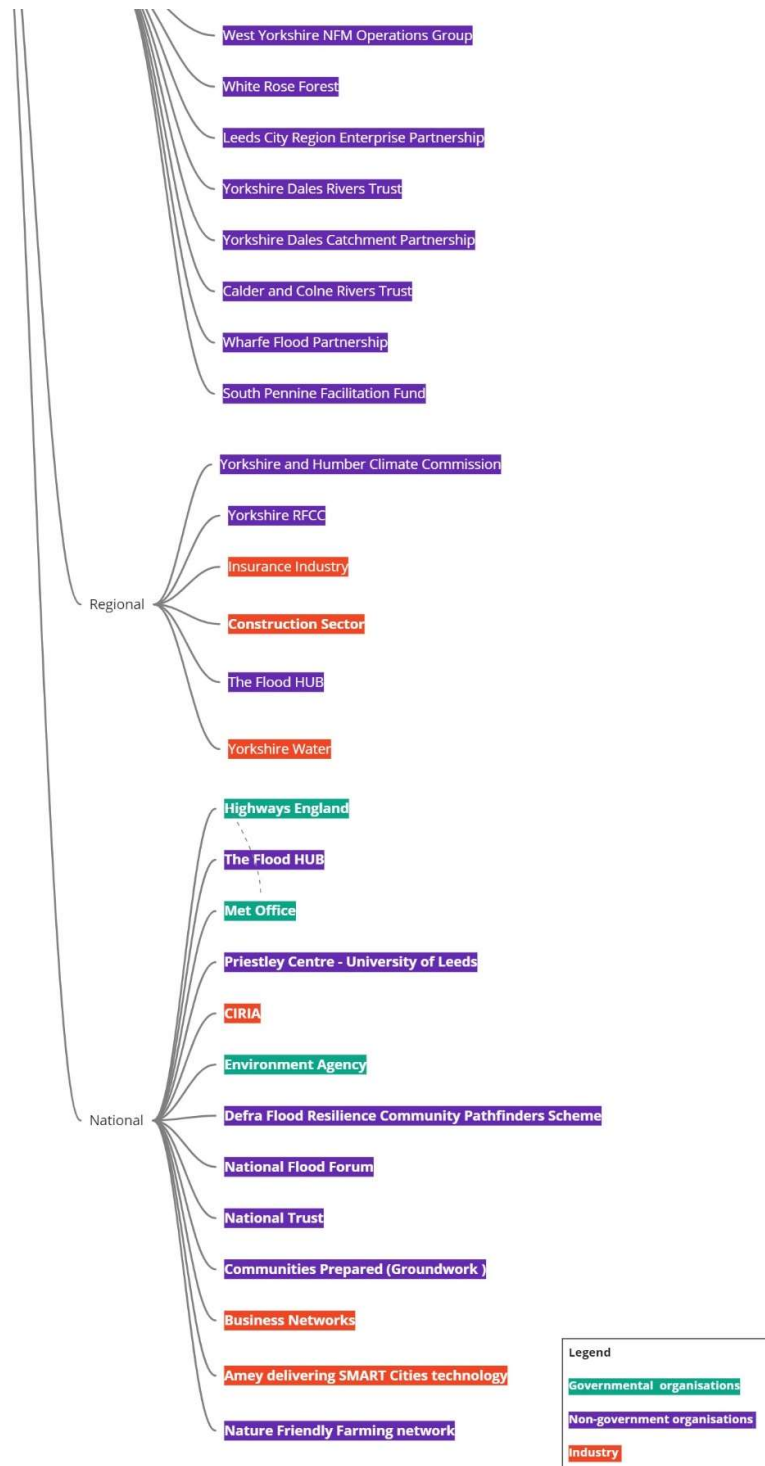


Figure 7: WY FLIP Partners categorised by scale

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14. Appendix C – Project Scoping Tool

The project scoping tool was developed to collaboratively scope and develop projects. It can be completed by partners in response to a funding opportunity, knowledge gap or project idea. The project scoping tool is designed to be filled in collaboratively in person, online or via e-mail. It provides an opportunity for programme partners to identify synergies and challenges across sectors from the outset of a project.

Table 3: Project scoping tool template

Project name:			
Location:			
Timescale & Development stage:			
	Opportunities/Strengths	Challenges/Weaknesses	Needs/Wish list
Multiple Benefits <ul style="list-style-type: none"> • Properties, environment, infrastructure protected • Water quality, Air quality • Empowered communities, increased awareness • Resilience to more extreme events • Improved Adaptions, Resistance and Recovery • Improved flood warning and understanding of risks 			
Utilising existing work <ul style="list-style-type: none"> • Similar projects • Pilot studies, case studies • Academic expertise • Industry expertise • Regional, national and international experience • Knowledge gaps • Knowledge sharing (e.g. WY FLIP knowledge library, community to community sharing) • Location 			

Collaboration <ul style="list-style-type: none"> Existing partners Existing networks Wish-list (e.g. sectors or organisations) Synergies between aims/projects Community relationships (e.g. community groups) 			
Resources <ul style="list-style-type: none"> Bid development Funding Resources e.g. software, assets, research Training Skills Opportunity and/or risk mapping Delivery mechanisms Academic expertise 			
Policies, Strategies, Approaches <ul style="list-style-type: none"> Local, regional, national strategies (e.g. Net Zero, inclusive growth) Liability, maintenance, adoption Design standards Asset management approach Floodplain development Top down vs bottom up approaches Taking risks Consents (e.g. OWC, planning permission) Linking public and private funds Green finance 			

<p>Success Measures</p> <ul style="list-style-type: none"> • Quantifying benefits • Monetary values of benefits • Develop standard metrics, use existing metrics 			
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15. Appendix D – Programme Actions

As a result of the consultation for this roadmap a number of actions which the Programme could support were identified. The actions are summarized in the table below. It is important to note that this table represents initial potential actions to date and should not be seen as a complete list of works covered by the programme. It is acknowledged that this table is accurate at the time of writing but will be updated over time as project progress.

WY FLIP Theme(s)	Activities	Objectives	Output/Impact	Previous experience/expertise	Next steps	Financing model
NFM	WY LLFA's to collaboratively develop a common approach to OWC	Streamline and speed up NFM implementation Manage risks from NFM	Efficient, risk-based process OWC	CMBC approach	Facilitate meeting with LLFA's FRMs	
NFM	Trial innovative approaches to enhance environmental and social resilience, e.g. by Land-use diversification such as agro-forestry (build on trial ongoing in Calderdale)	Enhance social and environmental resilience	Evidence and increased understanding of effects on FRM	On-going agro-forestry trial in Calderdale	Review existing work	
IWMS	Trial new techniques that manage surface water flooding from a range of sources by using deep boreholes to create large and effective soakaways in areas where traditional shallow soakaways don't work	Test innovative SuDS measures	Evidence and increased understanding of effects on FRM			
NFM	Integrate the existing opportunity/project of Aire Catchment SPV					
NFM	Provide evidence of multiple benefits by monitoring Upper Aire Project	Monitor multiple benefits of NFM	Evidence and increased understanding			
NFM/IWMS	Review and share lessons learnt from Calderdale NFM landowner grant scheme	Knowledge sharing	Potential roll-out of scheme across region			
CVS	Strategically build relationships with communities at risk of flooding, capture their views on what the	Community engagement and ownership of FRM	Community buy-in to FRM decisions			

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	priorities are for communities					
	Identify gaps in WY FLIP partnerships and networks, build on existing relationships and previous work to fill these gaps.	Engage wide range of partners to programme	Partnership working which leads to innovative solutions			
NFM/IWMS	Systems models to link upstream source areas to downstream communities at risk	Increase understanding of flooding problems to allow strategic decisions to be made.	Linked upstream solutions to downstream flooding problems			
NFM/IWMS	Opportunity mapping for multiple benefits E.g. integrate NFM and SuDS with local level biodiversity net gain.	Enhance multiple benefits of interventions by taking a strategic approach	Cost-saving efficiencies and enhanced multiple benefits			
NFM/IWMS	Strengthening business cases for multiple benefits, build on work in the BEGIN programme	Allow multiple benefits to be taken into account in business cases	Increase number of successful NBS business cases			
NFM/IWMS/ CVS	Work with the health sector to create opportunities and provide infrastructure to enable mental health and wellbeing benefits of NFM and SuDS to be realised	Realise and value health and wellbeing benefits of NFM and SuDS	Cost-saving efficiencies and enhanced multiple benefits			
CVS/IWMS/NFM	Collaborate to take into account the impact of flooding on health and wellbeing in the sustainable food systems theme of the Bradford food strategy.	Realise and value health and wellbeing benefits of NFM and SuDS	Cost-saving efficiencies and enhanced multiple benefits			
NFM/IWMS	Explore development of long-term governance and maintenance of NBS though a not for profit company, working with private sector partners and communities, sitting	Pilot long-term governance and maintenance solution for NBS	Increased uptake of NBS			

	alongside national agri-environmental schemes.					
EFWS/ CVS	set an inclusive communication arrangement that limits misinformation, and ensures the spread of useful and practical message to help direct people toward better flood resilience resources and practices.	Empower communities to be better prepared for flood events				
EFWS	Engage with Bradford University which is currently developing a mobile application geared towards emergency situations .					
PFR	Develop clear guidance about affordable PFR for residents and businesses at risk of flooding					
PFR/ CVS	Assess the risks, vulnerabilities and needs of households, charities and SME beyond physical properties to better understand people's experiences and hidden vulnerabilities during flood emergencies					
CVS/ PFR/ IWMS	Promote collaborative contribution from communities (E.g, pooled-funding) to help them invest in flood resilience improvements in their areas such as SuDs or helping low-income households and SME pay for insurance premiums.					
NFM/ IWMS	Lobby for change in the way funding for flood risk and					

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	environmental management is distributed to allow for multiple benefits					
CVS	Lobby for Government intervention to establish pooled funding, similar to Flood Re, but with greater eligibility, for example, for SME.					
CVS	Develop relationships and dialogue with the insurance industry to allow 'building back better' to increase a property's flood resilience rather than allowing only like for like rebuilding with insurance pay outs					
CVS	Develop relationships and dialogue with the insurance industry to allow community flood action groups to obtain insurance for their activities					
CVS	Provide evidence about the return on innovative flood resilience investments such as SuDS to allow insurance companies to take the impact of innovative interventions on flood damage savings into account.					





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