

Understanding the barriers to uptake of Property Flood Resilience (PFR) in Scotland

 Kate Glencross, Rachel Warren, Jane Eunson and Tamara Ansons, Ipsos MORI.

May 2021

DOI: <http://dx.doi.org/10.7488/era/947>

Executive summary

A recent study estimated that 284,000 properties in Scotland are at risk of flooding. This figure is expected to increase to 394,000 by 2080 as a result of climate change. In Scotland the responsibility for protecting property from flooding rests with the owner. It is important therefore that property owners and occupiers know how to protect their property to reduce the physical and emotional impacts of being flooded.

This report aims to support uptake of Property Flood Resilience (PFR) measures by:

1. exploring the reasons why people do not install PFR measures, using in-depth interviews with home and business owners who have been flooded; and
2. identifying what would help encourage owners to make resilient changes to their properties using lessons from Scotland, the UK and internationally, and across other disciplines, for example energy efficiency.

Key findings

Those interviewed for this study had minimal awareness of their flood risk prior to being flooded. Even when participants were aware of their property's flood risk, from first-hand experience or information after they moved in, they struggled to accept it as an ongoing risk. The sample interviewed comprised mainly those who had experienced surface water flooding rather than river flooding, which may have contributed to this perspective.

Some property owners acknowledged shared responsibility with national and local government, and key agencies for flood risk management. However, participants perceived PFR as largely or completely irrelevant to their property, even when they did accept their flood risk.

A clear hierarchy was evident in participants' attitudes towards different approaches to managing flood risk. Participants were most positive about flooding being managed at a street/area level through improved drainage systems including for example the removal of

leaves after a flood by the local authority. The second most palatable approach was through Property Level Protection (PLP) measures – such as flood gates, self-closing air bricks and other measures taken at a property level to keep the water out. Participants were least supportive of PFR measures which involved adjustments within their properties.

Using a Theory of Change approach to illustrate the journey home and business owners need to go on to become fully resilient to flooding, this report focuses on overcoming the lack of awareness and sense of responsibility as a priority.

The property and business owners interviewed were at an early stage on the journey to making their properties resilient. Their responses to the idea of PFR were not positive, overall, and the barriers that were apparent were complex and not easily overcome. Key barriers to the uptake included: financial costs; the view that resilience measures are not relevant to their situation because drain repairs / upkeep could solve the issue; lack of awareness of PFR; and a lack of information and support on PFR measures.

Looking internationally, there are few examples where interventions have made great inroads in increasing flood preparedness. Taken together the interviews and the evidence review show that there is no single or quick fix to increase PFR uptake – what is required is a series of interventions to tackle multiple and complex barriers. These must meet people at whatever stage they are at on the journey towards resilience.

The literature suggests a range of ways to shift attitudes towards flooding and the installation of PFR measures. Many of the barriers covered in the literature were also identified in the interviews, suggesting that Scotland may benefit from many of these interventions including: raising awareness of flood risk (and the severity of flooding, rather than the probability of it occurring); raising awareness of PFR; using familiar and/or trusted messengers in communications campaigns; and promoting the social acceptability of flood resilience.

Recommendations

Both strands of research indicated that the timing of communications is key and should be twofold. Firstly, there is a clear need for general awareness raising pre-flood in areas at risk to shift attitudes towards greater risk awareness and risk acceptance. Secondly, this should be combined with a targeted communication campaign and signposting to help and inform at the crisis stage immediately after a flood.

We recommend this should be done by ensuring accessible flood risk and resilience information and support can be easily found online. This work will need to involve an audit of current information, content development and user testing, and Search Engine Optimisation to ensure when people do look online, they find what they need. A number of lessons from the literature can be used to increase the effectiveness of this communications resource.

Further recommendations include:

- awareness raising activities and communications aimed at those that are at risk now and those that will be in the future;
- further targeted awareness raising, information and support for those that have been flooded;
- grants and loans for resilience measures;
- a single point of contact in the form of a trusted advisor / PFR surveyor scheme; and
- promotion of PFR through the insurance industry.

The need for information and support will increase as climate change increases the number of properties at risk of flooding in Scotland.

Contents

1	Background	4
1.1	Objectives	4
1.2	Methodology	5
2	Behaviour change and flood resilience	10
2.1	How we have used behaviour change models in this study	10
2.2	The Oakley Theory of Change	11
3	Accepting risk and responsibility	13
3.1	Interview findings	13
3.2	Interventions from the literature	16
3.3	Key lessons	19
4	Knowledge and awareness of PFR	20
4.1	Interview findings	20
4.2	Summary of the barriers	22
4.3	Interventions from the literature	22
4.4	Key lessons	24
5	Making the benefits outweigh the costs	26
5.1	Interview findings	26
5.2	Summary of barriers	27
5.3	Interventions from the literature	28
5.4	Key lessons	30
6	Summary of participants' experiences	31
7	Embedding in, and empowering communities	32
7.1	Interventions from the literature	32
7.2	Key lessons	33
8	Ensuring the environment around people makes it easy	34
8.1	Interventions from the literature	34
8.2	Key lessons	34
9	Removing some (or all) of the decision making	36
9.1	Interventions from the literature	36
9.2	Key lessons	36
10	Conclusions and recommendations	37
10.1	The challenge	37
10.2	Recommendations for first steps	37
10.3	Medium term recommendations	43
10.4	Further action	44
11	Appendices	46
	Appendix 1 Identified barriers and possible interventions	46
	Appendix 2: Detailed method for the rapid evidence review	51
	Appendix 3: In-depth interview discussion guide	53
	Appendix 4: ISM framework	59
12	References	60

1 Background

The Scottish Environment Protection Agency's second National Flood Risk Assessment in 2018 estimated that 284,000 properties in Scotland are at risk of flooding. This figure is expected to increase to 394,000 by 2080 as a result of climate change.¹ The Scottish Government and local authorities are developing flood schemes to reduce the risk of flooding to thousands of properties. Further to these schemes a recent study concluded that 81,000 household and business premises would benefit most from flood measures at a property level². However, only a few hundred properties currently have some form of PFR measures. PFR measures aim to minimise the impact of flooding, by limiting the amount of water that can enter a property and/or minimising the damage if water does enter.

In Scotland the responsibility for protecting property from flooding rests with the owner. It is important therefore that householders and commercial occupiers know how to protect their property to limit physical damage to buildings and lessen the longer-term emotional impacts of being flooded. The Scottish Government published the Living with Flooding Action Plan³ in November 2019. The plan sets out actions over two years to improve awareness and increase uptake of PFR: building a better evidence base; influencing policy and providing clear guidance; and recognising and supporting positive change.

Ipsos MORI was commissioned to:

1. explore the reasons why people do not install PFR measures; and
2. identify what would help encourage owners to make resilient changes to their properties; looking at lessons from Scotland, the UK and internationally, and across other disciplines, for example energy efficiency.

1.1 Objectives

Task 1: Exploring the reasons why people decide for or against installing PFR measures

This task was addressed through research interviews with property owners. It focused on answering questions on motivation towards, and understanding of the benefits of, PFR. This included examining decision points either as proactively anticipating future flooding or in the repair/build back process following a flood, including:

- a) identifying decision points, trusted information sources, and funding sources and finance mechanisms;
- b) expectations of, and experience in relation to, PFR performance; and
- c) perceived value of PFR and whether the measures provide value for money.

Task 2: Identifying what would help encourage owners to improve the flood resilience of their properties.

¹ SEPA - *National Flood Risk Assessment, 2018.*

² <https://www.climatechange.org.uk/research/projects/property-flood-resilience-scottish-baseline-study/>

³ <https://www.gov.scot/publications/living-flooding-action-plan-delivering-property-flood-resilience-scotland/>

This task was the subject of a Rapid Evidence Assessment (REA). This included identifying lessons from other jurisdictions and other disciplines and policy areas, for example energy efficiency, and the findings from Task 1 to identify what could encourage uptake of PFR in the Scottish context. The following research questions were used:

- a) What confident knowledge exists on what works in encouraging and enabling owners to make changes to their properties?
- b) What lessons can PFR in Scotland learn from PFR in other jurisdictions and other building intervention schemes to overcome barriers identified in task 1?

1.2 Methodology

Despite planning to undertake both strands of this project simultaneously, delays in recruitment of participants for the interviews (detailed below) meant that the evidence review took place first. The following sections cover the methodology used in each strand of the project.

1.2.1 The Rapid Evidence Review

The REA began with some initial searches for research into behaviours around preparedness for floods and other disasters - with a focus on evidence of how barriers to the uptake of resilience measures had been successfully overcome. After this initial scoping, the following inclusion criteria were agreed.

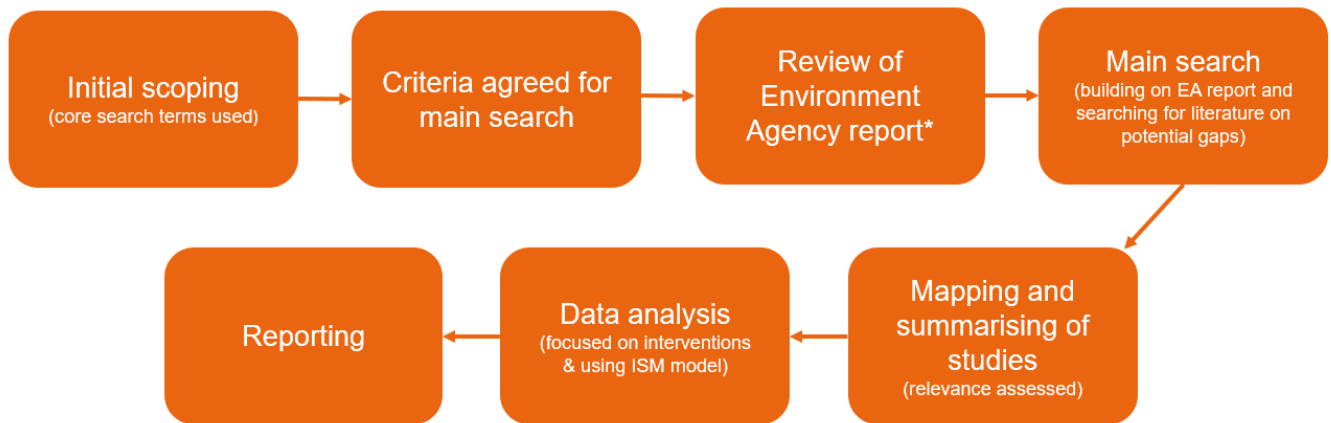
Table 1: Evidence review inclusion criteria

Criterion	
Topics	<ul style="list-style-type: none"> • Behaviour change approaches which have been effective in encouraging home and business owners to take action and/or acknowledge their responsibility for taking measures (for flood or other disasters), including: <ul style="list-style-type: none"> ○ Role of legal regulation ○ Role of insurance companies • Research on how best to communicate risk
Date	<ul style="list-style-type: none"> • Last 15 years
Methodology	<ul style="list-style-type: none"> • Primary or secondary research including other literature reviews
Coverage	<ul style="list-style-type: none"> • Scotland, UK and international • Countries with governance and funding structures that are comparable to Scotland, and where home and business owners are responsible for taking measures
Commissioner / type of publication	<ul style="list-style-type: none"> • Third sector, public sector, academia, 'grey literature'

Because this was a rapid review, six research days were allocated to searching, collating and writing up findings. Thirty-one papers were included in the data analysis stage. These included studies using qualitative and quantitative methods, desk research and literature reviews, and some that focused more on the use of behavioural science in this area. The majority covered countries in Europe including Scotland, the rest of the UK, France,

Germany, Italy, Romania and Finland. Studies covering New Zealand, the US and Canada were also reviewed. The flowchart below provides an overview of the methodology (see appendix 2 for details).

Figure 1: Overview of the methodology



*Discussed below

1.2.2 Recent literature review by the Environment Agency

One of the most useful and relevant studies identified in the early stages of the review was *Applying behavioural insights to property flood resilience*, published by the Environment Agency in England and Wales in September 2020 (Park, Oakley & Luptakova, 2020). In compiling this paper, the authors covered more than 250 pieces of literature on responses to hazards, including flooding, and behavioural insights that underpin them. The Environment Agency report contained a wealth of evidence relevant to the objectives of the REA. To ensure the REA built upon this sizeable and significant study, we allocated one day to thoroughly review it.

1.2.3 The in-depth interviews

Qualitative in-depth interviews were undertaken from October 2020 – January 2021 with people whose property had been flooded recently in Scotland to explore their experiences of the flood, including the repair process, and to identify barriers to the uptake of PFR. Table 2 summarises the criteria for inclusion:

Table 2: Qualitative sample recruitment criteria

Criterion	
Types of properties	Owner-occupier homes ⁴ Businesses (micro / small – fewer than 10 employees)
Date of flooding	Last three years
Repair status	Started the repair process Not employed extensive PFR measures
Location	Across Scotland
Types of flooding	Pluvial (Surface)) and Fluvial (River)

A total of 14 interviews were conducted by telephone with participants across Scotland who had experienced flooding in their home or business within the last three years and who had not implemented extensive PFR measures (see appendix 3 for interview guide).

Eleven participants were homeowners while three were business owners. Participants were a mix of ages, genders and household types and comprised both fluvial and surface water flooding (Table 3).

Table 3: Qualitative sample profile

Characteristics	Number of participants
<i>Age</i>	
18-34	4
35-54	5
55-64	3
65+	2
<i>Gender</i>	
Male	4
Female	10
<i>Home or business</i>	
Homeowner	11
Business owner (with responsibility for repairs)	3
<i>Household type (homeowners)</i>	
Lives alone	5
Lives with partner (no children)	2

⁴ Only property owners were included in this study because this is the simplest scenario in terms of where responsibility lies for making changes to the property. There is a need for further research to capture the experiences of those in the private and social rented sectors.

Living with children under 18	4
<i>Type of flooding</i>	
Pluvial / Surface water (rain)	12
Fluvial (river)	2

Participants were recruited through a wide range of channels including through the Scottish Flood Forum, local Flood Action groups, Facebook groups in areas of high incidence of flooding, Twitter, and personal and local networks.

The interviews lasted around 45 to 60 minutes and were recorded for analysis purposes. The conversations followed a structured topic guide, designed by the Ipsos MORI research team, and covered the following topics:

- Awareness of flood risk prior to flooding
- Views, awareness and uptake of any PFR measures prior to the flood
- Views on responsibility around managing flood risk
- Awareness of information and support services for flood victims
- Experience of flooding including the material and emotional impacts
- Awareness and access to sources of advice after the flood
- Experience of the repair process including decision-making
- Awareness and views on flooding mitigation measures including PFR
- Reasons for not installing PFR measures
- Views on what might promote uptake of PFR measures

All participants were offered £30 by BACS transfer or e-voucher code as a thank you for their time.

1.2.4 Scope, challenges and limitations

While the evidence review identified many papers exploring the barriers and behaviours around this topic, there are few which provide real life examples of where barriers have been significantly reduced or overcome (particularly where the evidence is in countries with similar governance to Scotland / the UK). There was also a lack of relevant studies relating to other natural hazards and related building intervention schemes – particularly in countries with comparable governance and funding structures. The gaps identified in the review are included in the suggested areas for further research section in the final chapter.

There were considerable unanticipated challenges around recruitment of participants for the interviews, leading to a smaller number of interview participants than originally hoped (20). This may have been, at least in part, due to the difficulties and disruption to people's personal circumstances as a result of the COVID-19 pandemic, in conjunction with the sensitive nature of the topic. The impact of this smaller sample size is that we may not have covered as many different circumstances as we would have had the opportunity to do in 20 interviews. We were particularly low on business owners in the sample (three instead of six) and those who had experienced river flooding (two) as opposed to surface water flooding (twelve). While, clear themes emerged from the qualitative data we did gather, giving us

confidence in the findings overall, it should be borne in mind that the findings are likely to be more representative of the experiences of those who have had surface water flooding, and that this is a limitation of the research. It should also be noted that ClimateXChange's Baseline shows there is a higher proportion of households at risk of surface water flooding amongst the properties that would most benefit from some form of PFR.⁵ Over half of the 81,000 households identified as potentially benefiting most from PFR measures are at risk of surface water flooding, compared with just over third that are at risk of fluvial flooding. Approximately ten percent are at risk because of coastal waters (however, this group are not covered in the interviews for this study). Based on the number of interviews in this study we cannot say whether the sense of responsibility for flood risk management, view of PFR as a relevant option, or barriers to implementing PFR measures vary between these groups.

A further limitation of the interviews is that we did not speak to people who live in a flood risk area (so may also benefit from installing PFR) but whose property had not been flooded. It was agreed in the initial stages of the project that we should focus on property owners whose property had already been flooded, in order to capture the full timeline of key decision points, and their experiences of support and advice at the crisis stage and property repair stage. However, many of the recommendations in this report will also be relevant to people who have not yet experienced a flood.

It should also be noted that the interviews did not allow the full exploration of certain objectives mentioned above. This was because awareness and understanding of PFR was very low, and participants were therefore not able to comment specifically on: funding sources and finance mechanisms for PFR; and experiences in relation to the performance of PFR measures (although we did touch on expectations of measures).

The main sections of this report pull in findings from both the literature and the interviews, although some later sections focus more on learnings from the literature - simply because that part of the project allowed us to cover a broader set of themes. For example, the literature emphasised the value of empowering communities to increase flood resilience, but this was not covered in detail in the interviews because participants would have only been able to comment on this topic hypothetically (as no participants were aware of / participating in a community flood group).

Qualitative samples are designed to ensure that a range of different views and experiences are captured. It is not appropriate to draw conclusions from qualitative data about the prevalence of particular views or experiences. As such, quantifying language, such as 'all', 'most' or 'a few' is avoided as far as possible when discussing Interview findings in this report.

⁵ <https://www.climateexchange.org.uk/media/4182/property-flood-resilience-scottish-baseline-study.pdf> See p15, Table 5.

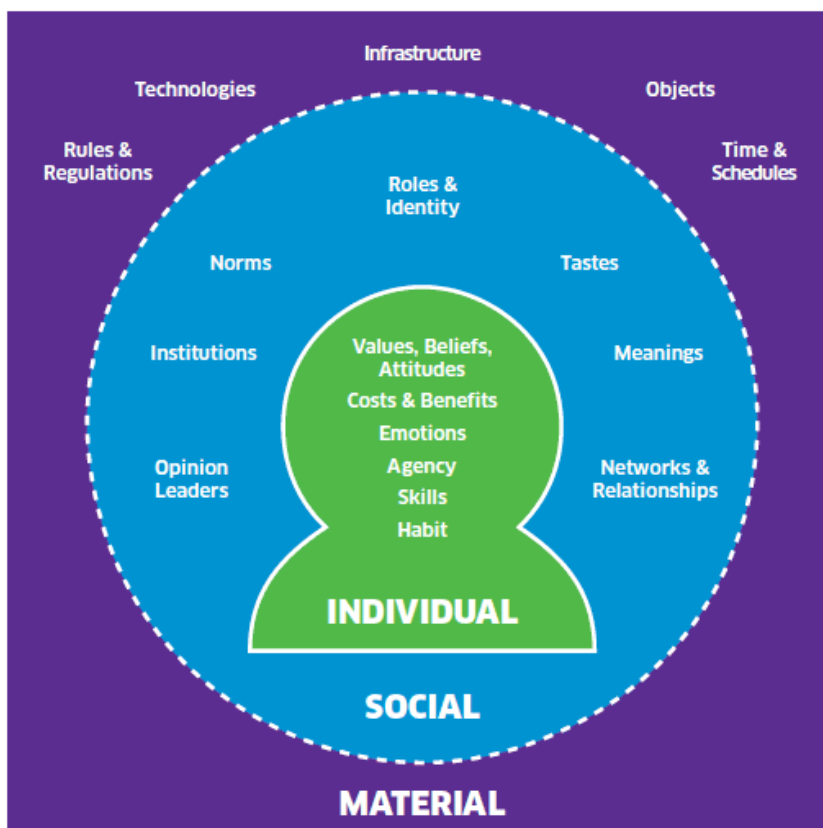
2 Behaviour change and flood resilience

2.1 How we have used behaviour change models in this study

Behaviour change research improves our understanding of why people demonstrate certain behaviours. Various behaviour change models exist, all of which use a series of factors or characteristics to ‘diagnose’ or categorise behaviours. Models can also offer insight into the types of interventions that could bring about behaviour change, if required. Behavioural science and behaviour change models are now used across a broad range of policy areas including health, education and energy.

In this study we have used two behaviour change models to aid the research design and our analysis of the data collected. The model we have primarily drawn upon is known as ISM and is the model used by the Scottish Government (see the appendix 4 for further details). ISM stands for Individual, Social and Material factors that can shape behaviours. The diagram below details the factors under these three categories.

Figure1: The ISM Model



The ISM model was used in the design of the discussion guide to enable us to fully consider a wide range of potential barriers to explore with participants. We also used it to help unpick what part of the ISM model was being targeted by the interventions identified in the evidence review. In the overall analysis of the data gathered in both parts of this project, we bring together the barriers from the interviews and the interventions from the literature to

make a series of recommendations. Furthermore, to bridge the gap between the barriers and interventions, we used MAPPS (the Ipsos MORI Behaviour Change Framework) to provide guidance on the development of effective intervention.

The MAPPS framework was developed by behaviour change specialists in Ipsos MORI and is similar to ISM in the way that it ‘diagnoses’ or categories behaviours under certain factors.⁶ It is based on the COM-B system and Behaviour Change Wheel process, which provides guidance on how a ‘diagnosis’ feeds through to shape how interventions could be developed through ‘Intervention Principles’. To this end, MAPPS was used to build upon the ISM ‘diagnosis’ to draw on the ‘Intervention Principles’ to provide more specific recommendations for their development.

Figure 2: The MAPPS Framework

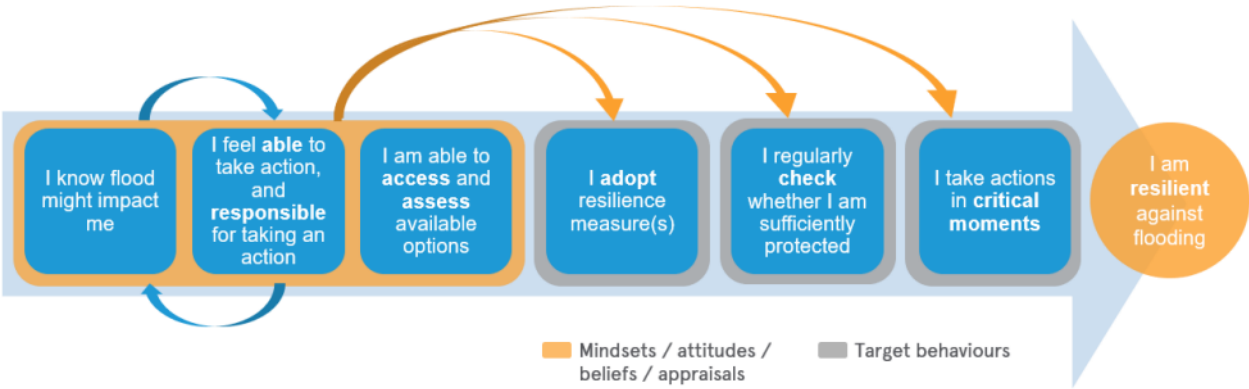
MAPPS DIMENSION	MAPPS CATEGORY	Contents	WHAT IT MEANS
Motivation	Outcome expectations	How estimation/predictions about outcomes affect motivations	I don't think it will work
	Emotion	How feelings/emotions and emotion regulation can support behaviors	I'm not feeling like doing it
	Internalisation	How behavioral motivation evolves from extrinsic to intrinsic	I don't want to do it
	Identity	How personal and social identities support behaviors	I'm not that kind of person
	Self-efficacy	How feelings of self-efficacy and mastery support change and persistence	I don't feel able to do it
Ability	Capability	How we learn new behaviors	I don't have the skills to do it
	Routines	How behaviors become habits, embedded in routines	It's not part of what I usually do
Processing	Decision forces	How heuristics, biases and behavioral regulation guides decisions and behavior	How things are processed
Physical	Environmental factors	How the physical environment, context and resources sparks, supports or impairs behavior change	How things are set up
Social	Social Norms	How group, transient or situational norms guide behavior	What's expected of us
	Cultural Values	How broad cultural values affect behavior	The way we live

2.2 The Oakley Theory of Change

The aforementioned review by the Environment Agency uses a six step theory of change to explore the barriers to installing and maintaining PFR (Oakley, 2018) (Figure 3). The model lays out the steps that home and business owners need to go through in order to become fully resilient to flooding.

⁶ For a more detailed explanation of the MAPPS framework see: <https://www.ipsos.com/en/science-behaviour-change>

Figure 3: Property flood resilience – theory of change (Oakley, 2018)



Our overall approach and the structure of this report uses this model as it illustrates the journey home and business owners need to go on to become fully resilient to flooding. The evidence review and the primary research focus on the first four stages.

3 Accepting risk and responsibility

This section of the report covers participants' attitudes and behaviours in relation to flood risk, and how they perceive responsibility for mitigating risk in their properties. It also includes the interventions which the literatures suggests may help property owners to overcome these barriers to becoming more flood resilient.

These findings relate to the first two stages of the Oakley Theory of Change – knowing there is a risk of flooding and feeling responsible for taking action (the second part of the Stage 2 – feeling able to take action – is addressed in the next chapter).

3.1 Interview findings

3.1.1 Awareness of flood risk

Generally, participants reported no awareness of their property's risk of flooding prior to their first flood. Their prior understanding and awareness of flood risk had typically been only in an abstract context, such as in the news or in documentaries about other areas or countries affected, rather than relating to them personally or even to their local area.

“Really nothing, and where I live there is no rivers, there's nothing, so ... I didn't know anything at all.” (Female homeowner, 65+, Edinburgh, surface flooding in 2019)

“Never through personal experience – don't even think knew anybody [who has been flooded]– more through news and reports in media ...one of those things you can imagine how bad it would be... I didn't appreciate how much of a hassle...” (Female homeowner, 18-34, North Lanarkshire, surface flooding in 2020)

Greater flood awareness tended to be linked to knowing others (e.g., friends, family and neighbours) who had been affected, resulting in an understanding of the gravity of the consequences.

Participants were divided between those who had considered their flood risk when buying their property (because they had been affected by flooding at another property or had friends or family that had been), and those who had not thought about it at all. Those that did consider whether the property was at risk before buying (by checking its proximity to water and/or checking the SEPA flood map) concluded that there was little or no risk.

“If I'm looking for a house I will always consider, is it going to flood? You know, it is just a sensible precaution to ask yourself and it just never occurred to us, we have a house on a hill, there is no way it's going to flood” (Male homeowner, 55-64, Edinburgh, surface flooding in 2020)

Apart from those who had specifically requested it, flood victims did not tend to have reported receiving information about their property's flood risk at the sale stage, remarking that it was not mentioned to them at any point in the process or detailed in the home report.

There were participants who had been informed of their flood risk at some point after buying the property, through local knowledge and information from neighbours, but who did not appreciate the severity of the consequences.

“I didn't realise it would be as catastrophic as was the case on this occasion.” (Male homeowner, 55-64, Edinburgh, surface flooding in 2020)

3.1.2 Accepting risk

Even when participants were aware of their property's flood risk, from first-hand experience or information after they moved in, they struggled to accept it as an ongoing risk. One explanation for this was an inability to understand how their property might flood, not being close to a river or water source. Further, previous flooding was sometimes perceived as a “freak” exceptional incident that would not happen again in many decades.

“When I moved in a couple of neighbours had said, oh, do you know that house gets flooded? I said, well I doubt it because it's not near any water and that... I didn't think that it would get flooded really, I thought it was just a rumour somebody was making up.” (Female homeowner, 65+, Edinburgh, surface flooding in 2019)

In a similar vein, even after first-hand experience of a previous flood, there were those who did not fully accept their risk for future flooding, perceiving their flooding as an exceptional event unlikely to happen again any time soon. They attributed it to extreme weather or misfortune.

“When it flooded in 2012, I very much thought it was a fluke, I didn't think it was an issue with my flat. I thought it's a one off, really, really, heavy rain, it won't happen again, act of God type of scenario.” (Female homeowner, 35-54, Edinburgh, surface flooding in 2020)

The denial of risk may also be connected to how distressing the experience of their property being flooded was. Participants described their sadness and devastation at the damage caused and the stress of the clean-up and repair process. It was difficult for participants to revisit what had happened, and was apparent that their focus was on the future and getting life back to normal (or enjoying normal life now that the repairs were done), rather than considering risk and the potential for it to happen again.

3.1.3 Accepting responsibility

While public bodies in Scotland have wider flood risk management roles, the responsibility for protecting an individual property from flooding, and for making it resilient to potential damage, lies primarily with the property owner. The interviews showed a general lack of awareness of this. This section covers attitudes towards responsibility as a barrier, but does not assess to what extent participants were correct in their assumptions and views.

A first perspective was that public bodies such as local authorities, SEPA, Scottish Water and the Scottish Government held sole responsibility for flood risk management through prevention measures such as not building on flood plains and ensuring infrastructure

supports drainage. This belief was explained with reference to a conviction that, if these organisations had taken action earlier, the flood could have been prevented.

“I feel like the Council should be doing more, because the issue with my flood was related to the drains and it was specifically council drains. So, I feel like it is their responsibility,” (Female homeowner, 35-54, Edinburgh, surface flooding in 2020)

Participants who held this view expressed their anger and frustration and a feeling that these organisations were not fulfilling their responsibility in protecting communities from flooding. This topic raised comments on broader concerns about planning permission and the building of new housing without full consideration of the flood risk this might create for other residential areas.

A second perspective was that flood prevention and mitigation was a shared responsibility between property owners and public agencies such as local authorities. These participants accepted some responsibility but felt it also lay in part elsewhere.

“Local government have a responsibility to provide adequate drainage. We pay a lot of Council Tax and you get less for your money each year. My pipes are my responsibility. And in 2000 I was by a river so I had more responsibility.” (Female homeowner, 65+, Glasgow, surface flooding in 2019)

The third perspective was that the responsibility for protecting properties from flooding lay with the property owner, based on a belief that it would be an unrealistic burden to place on local authorities.

“Homeowners. It's not realistic of us to say the council, there are so many properties / different situations” (Female homeowner, 18-34, Fife, surface flooding in 2019)

As discussed in section 1.2.4, the qualitative interview sample was skewed towards those who had experienced surface flooding rather than those who had experienced river flooding. While no clear differences between these two groups emerged in relation to views on responsibility, the sample size (particularly the number of properties flooded by river flooding) was too small to say with any certainty that these owners share the same views on responsibility. Further research with a larger sample would be required to explore whether there are differences in views between those impacted by different flood sources.

3.1.4 Perceived relevance of PFR

Overwhelmingly, participants perceived PFR as largely or completely irrelevant to their property, even when they did accept their flood risk. This was the greatest barrier to uptake identified in the interviews. Two main explanations were given.

First, a belief, linked to views about where responsibility lies and the perceived failures of local authorities to prevent flooding through drainage maintenance, that the solution to their flood risk lay in improving drainage systems. This included drainage at a regional level, such as improved local authority drainage infrastructure, at a neighbourhood level, such as culverts on their street, and at a property level, including garden landscaping. Participants

were confident that these solutions alone would be sufficient to prevent water entering their properties during any potential future flooding episodes.

“If the infrastructure works, then there is no reason for us to be flooded, you know, the properties haven’t been flooded in 130 years. So, you know, there’s no reason for it [PFR]. It’s reasonable if you live on a flood plain, but I don’t think it’s applicable here.” (Male homeowner, 55-64, Edinburgh, surface flooding in 2020)

A second belief was that their property was already fairly resilient in terms of its structure and materials and there was not much scope for improvement. This was typically for reasons relating to the safety, accessibility or style of the property rather than it having been designed that way for flood risk mitigation. Participants highlighted raised sockets or “resilient” kitchen units as examples.

“There is concrete/space underneath so the property is raised above the floor and the units are already quite resistant, and sockets already raised...so that’s about as resilient as it will ever be.” (Male business owner, 35-54, Arran, surface flooding in 2020)

More generally, a clear hierarchy was evident in participants’ attitudes towards different approaches to managing flood risk. Participants were most positive about managing flooding at a street/area level through improved drainage systems including for example the removal of leaves after a flood by the local authority. The second most palatable approach was through Property Level Protection (PLP) measures – such as flood gates, self-closing air bricks and other measures taken at a property level to keep the water out. Participants were least supportive of PFR measures which involved protection within their properties. There was a sense that it simply made more sense to take only preventative action, at least as a first step, and only to also invest in property protection if these measures failed to keep water out of their property.

3.1.5 Summary of the barriers

The following list summarises the key barriers around risk and responsibility identified in the interviews:

- Low / no awareness of flood risk
- Lack of acceptance of flood risk
- Perceived lack of responsibility for flood protection or resilience
- Perceived irrelevance of PFR measures

3.2 Interventions from the literature

The following section examines what the literature tells us about the interventions which may help to shift attitudes towards flood risk and resilience when the above barriers exist.

3.2.1 Communications to raise awareness of risk

Echoing the Interview findings from this study, the literature identified a need for communications to raise awareness and acceptance of flood risk, as well as understanding of its severity.

Many of the studies reviewed suggested that the effectiveness of communications could be increased by simplifying messages and appealing to people's emotional reactions to floods. Psychometric studies of the properties of hazards suggest that, if people do not feel negative enough about the consequences of a flood, they are not likely to take steps to improve their property flood resilience (Park et al., 2020). Park et al. recognise that, while the use of emotive content (and 'fear arousal') has been shown to motivate action (Witte, 1992), if it goes too far it can cause denial or avoidance, as well as raising ethical questions. Their 2020 study highlights an evidence gap in where the balance of this type of messaging lies.

There is some research suggesting that the presentation of emotion-laden images of flood damage contributes to perceptions of higher risk among participants (Terpstra, 2011; Keller et al., 2006; Siegrist and Gutscher, 2006). A study in Sweden found that emotionally laden communications could have an effect on people who had not previously been directly impacted by flooding. (Västfjäll et al. 2008).

In their study covering flood risk communications in Finland, Ireland, Italy and Scotland, O'Sullivan et al (2012) emphasise that communications attempting to convey the probability of a flood have little impact, but those that emphasis severity are more effective. Oakley supports this point, stating that consumers struggle to make decisions in uncertainty (i.e. when risk is involved) and that households that understand the severity of flood damage (emotionally and otherwise) are more likely to take action to protect their properties. He cites the use of the "1 in 100 years storm" formulation as an example of easily misunderstood or misinterpreted language around the likelihood of flooding. (Oakley, 2018).

There are several studies that make a strong case for messages which make people feel empowered to do something, as opposed to focusing solely on conveying the level of risk (Park et al., 2020). Poussin et al (2014) and Bubeck et al (2013) assert that flood risk communication is insufficient unless it also specifies the potential measures that can be taken. In their 2011 study covering the Netherlands,⁷ Kievik and Gutteling recommend explicitly reinforcing coping appraisal through messages emphasising sentiments such as 'yes, you can do it' and 'yes, it works.' They argue that successful communications need to create a fear response but also make people feel that that they are capable of doing something and that the action they take will be effective (self and response efficacy). This review of evidence did not find any examples of communications campaigns that demonstrate this approach working, or otherwise. Again, further research is required to develop and test messages, and then evaluate any campaigns.

⁷ *Yes, we can: motivate Dutch citizens to engage in self-protective behavior with regard to flood risks.* Kievik and Gutteling, 2011. While we have not included many studies covering the Netherlands (because government there holds far greater responsibility for flood protection than in Scotland / the UK), this study was deemed relevant because it is focused on the actions of private citizens.

3.2.2 Communications to make PFR a social norm

The literature also identified a need to promote PFR as the desirable social norm. A 'social cost' of installing resilience measures may mean going against the 'groupthink'⁸ of peers and neighbours. Communications could help to address this by shifting public attitudes towards flood resilience being the 'normal' stance. Park et al (2020) make the case for promoting PFR as the desirable social norm (e.g. highlighting that other people are taking the risk seriously) as a potentially powerful intervention.

3.2.3 Delivery and timing of communications

Mass media advertising is recommended in the recent Environment Agency behavioural insights review as a way of raising awareness of risk among the general population (Park et al., 2020). Others recommend combining this with information via known touchpoints such as libraries, police stations and council offices (O'Sullivan et al., 2012). Social media clearly has a role to play in raising awareness among those at risk, and there is evidence that highly emotive content is more likely than positive imagery or messages to be shared on social media (Dobele et al., 2007).

Park et al. (2020) recommend the following approaches to message delivery:

- **Use of familiar messengers** – known brands (Tyers 2017), celebrities, 'people like us'. People are known to allocate more credibility to the message when it comes someone similar to them (Dolan et al. 2010, Moser 2010, Esposito et al., 2013).
- **Use of experts as messengers** – these are perceived as more powerful (Chauhan and Mason 2008, Heath and Heath 2007, Wilson and Sherrell 1993), particularly in situations of uncertainty (Petty and Briñol 2010), because when we have little first-hand information to go on, we are more likely to rely on others.
- **Multiple messengers** - people give more consideration to a message when there is consensus around it and when it is presented consistently across different situations (Kelley 1967).
- **Converted communicators** – there is evidence to show that people who have already taken action are more effective at persuading others to do the same. Community organisers who themselves owned solar panels recruited 63% more households to install them than those who did not themselves own solar panels (Kraft-Todd et al., 2018).
- **Government messengers** – while the perceived credibility of expertise may be low, trust in the government may be higher compared with commercial organisations with potential profit motives (Park et al., 2020).

The literature suggests that the timings of communications can improve their efficacy. There is consensus that immediately after a flood is the best window of opportunity for increasing the uptake of PFR. It is at this stage that appreciation of the risk, and motivation to prevent further

⁸ Groupthink is a psychological phenomenon in which people strive for consensus within a group. In many cases, people will set aside their own personal beliefs or adopt the opinion of the rest of the group (I L.Janis, 1971).

damage, will be highest. This is also a practical opportunity, given repairs and the disruption of construction work will need to take place anyway. However, as Park et al. emphasise, there are other barriers at this stage, such as the desire to get ‘back to normal’ as soon as possible, and the costs and complexities of researching and deciding what resilience measures to adopt (Park et al., 2020). Other windows of opportunity are when any renovations are being done to a property and when a property is sold - if there was a flood protection (or ‘performance’) certificate system in place (Oakley, 2018). The resonance of messages could be improved if communications coincide with periods when flooding features prominently on the news – either during floods or on anniversaries of them (O’Sullivan et al, 2012).

3.3 Key lessons

The literature suggests a range of ways to shift attitudes towards flooding and the installation of PFR measures. Many of the barriers covered in the literature were also identified in the interviews, suggesting that Scotland may benefit from many of these interventions including: raising awareness of flood risk (and the severity of flooding, rather than the probability of it occurring); raising awareness of PFR; using familiar and/or trusted messengers in communications campaigns; and promoting the social acceptability of flood resilience.

Both strands of research also indicated that the timing of communications is key and should be twofold. Firstly, there is a clear need for general awareness raising pre-flood in areas at risk to shift attitudes towards greater risk awareness and risk acceptance. Secondly, this could be combined with a targeted communication campaign and signposting to help and inform at the crisis stage which should occur immediately after a flood. The former could be aimed at a broader population than those currently defined as ‘at risk’ because we know that, due to climate change, in the coming decades we will see the number of properties at risk increase and it makes sense to begin to increase awareness and shift attitudes towards flooding now.

Our literature search did not reveal any interventions which clearly showed how to effectively address the sizable attitudinal barriers of not feeling PFR is relevant and not feeling it is ‘my responsibility’ – both of which were clear themes from the interviews. Both the interview findings and literature point to the need to raise both awareness and acceptance of flood risk.

We suggest an approach which clarifies roles and responsibilities in a positive way to help those at risk feel that they are not in this alone and to combat sentiment that the authorities are ‘passing the buck’ to individual home and business owners. This could be done via messages that explain what different organisations (Government, local authorities, SEPA, Scottish Water etc) are doing to reduce the effects of climate change and flooding – in a way that demonstrates that the responsibility is shared among multiple agencies and individuals which all have a part to play. PFR measures could also be made to appear more relevant to people if they were shown examples of where they had really made a difference in other properties. There are examples of how measures have worked in homes and business available online⁹. However, they may not be accessible or easily found.

⁹ <http://www.marydhonau.co.uk/>

4 Knowledge and awareness of PFR

This chapter covers the sizable PFR knowledge gap among those whose property had been flooded and the range of ways in which people can be supported in building their understanding of resilience measures so they feel able to make informed choices around flood preparedness. This relates to the second and third stages of the Oakley Theory of Change — feeling able to take action and being able to access and assess the available options. Again, the chapter covers the Interview findings first, followed by the interventions from the literature.

4.1 Interview findings

4.1.1 Awareness of PFR

Awareness of flood protection measures was low among those interviewed in this study. Typically, they had neither heard of nor considered any types of protection measures for their property either prior to or after their flooding. There were those who had a degree of awareness of some types of property level protection such as flood gates.

At the property repair stage, following flooding, the main priority influencing homeowners' decisions tended to be making their home "liveable" again as quickly as possible. This was particularly emphasised by those who expressed frustrations around slow responses from insurance companies or loss adjusters leading to delays in the repair process and to returning to their property.

It had typically not occurred to participants at the repair stage to take action to mitigate the impact of any potential future flooding. Reasons for this included the issues of acceptance, responsibility and irrelevance of PFR discussed in Chapter 3. However, participants also tended to be unaware of PLP or PFR measures and simply felt that the best they could do at the time was to resume normal life as quickly as possible with standard repairs. More exceptionally, participants had sought information about how best to repair after flooding but not found an answer as to what would work best for their property, as discussed below.

No participants had heard the term "Build Back Better"¹⁰ and only a few had considered flood resilience as a factor in their repairs, unaware of the term PFR.

4.1.2 Access to information, support and advice

The interviews revealed that flood victims experienced difficulties accessing information and support about repairing their property after flooding. Participants felt that there was a general lack of useful information or support available to flood victims. They typically did not know where to seek advice or information about recovery from the incident.

Those who had sought advice from official sources were generally dissatisfied with the response. A range of organisations had been contacted including local authorities, Scottish Water and Citizens Advice Scotland. Participants reported hearing nothing for weeks or

¹⁰ The term 'Build Back Better' is used by organisations such as Flood re to explain the idea of PFR and to encourage people to make their homes more flood resilient following a flood event.

months after their enquiries. Another theme in the research was negative experiences of insurance companies, who participants felt had caused unnecessary delays in the repair process and uncertainty about the repairs and services they could offer. Loss adjusters were described as not providing a direct phone number which made contacting them time consuming because property owners had to go through a switchboard or wait for a call back. Participants tended to report better relationships with tradespeople than with insurance companies, either because they felt they had their interests at heart, or because they had more face to face contact.

Those who searched online for help expressed disappointment that they had not managed to identify the guidance they needed. Participants were unclear what advice they should seek in the first place (on flood preparedness) and unfamiliar with terminology such as PLP and PFR.

The lack of readily available information led people to turn to friends and family.

“Probably the best information I received was [from] my dad, he does a lot of DIY, so although he is not a professional, he kind of has a base knowledge of restorations and what might need to be done, so he actually visited the property a couple of times just to give his amateur opinion I would say. But it was better than nothing...”.
(Female homeowner, 18-34, Fife, surface flooding in 2019)

There was a clear appetite for a single source of information or an independent specialist with flood victims’ interests at heart to provide impartial advice at the stage of repair and to guide them through the process.

“It would be great if someone could take that on for you and could advocate for you, and take you through the rebuild process.” (Female homeowner, 65+, Glasgow, surface flooding in 2020)

4.1.3 Availability of different repair options

When it came to making decisions about repairs, participants did not tend to be aware that they may have a choice of options. There were two key factors contributing to this impression. Firstly, low awareness of property protection measures and, secondly, insurance companies only offering a ‘like for like’ replacement. Participants described “deferring” to their insurer, not necessarily out of a trust in their decisions, but because there was generally no opportunity for discussion of options - they were not aware of any alternatives, and costs were a driving factor in the decision.

“I didn’t really have a choice, it was going to be a settlement figure which wasn’t enough or like-for-like [repairs]” (Female homeowner, 18-34, Fife, surface flooding in 2019)

So, despite participants not always fully trusting insurers, they felt like they had to take up what they were offering. Insurers appeared to have a great deal of influence over what happened next and are obviously a point of contact that everyone who makes a claim for

flood damage must interact with. The point at which insurers agree to make a pay-out therefore appears to be a key potential point at which PFR could be successfully promoted.

4.2 Summary of the barriers

The findings from the interviews, therefore, indicate that the key barriers relating to knowledge and awareness of PFR are:

- Low / no awareness of flood resilience as a concept nor of PFR measures
- Lack of information, support and advice (including technical knowledge, and a single source of clear, trustworthy information)
- Perceived lack of choice around repair decision making

4.3 Interventions from the literature

The literature review identified no previous research measuring levels of awareness and understanding of PFR measures among those at risk of flooding in Scotland. This may be because PFR is a relatively new and sometimes highly technical field.

The evidence is split on the effectiveness of information provision from various sources. While some studies report that information provided by insurers, governments and local authorities had little or no impact on uptake of resilience measures, others say it does make a difference (Hanger et al., 2017). However, it is clear from the literature that people taking measures only do so after seeking information and understanding their options. Building skills and knowledge in this area is a vital part of the journey to making a property flood resilient. Information provision needs to serve a number of purposes in moving people along the theory of change model / encouraging uptake:

- To **empower and enable decision making** – *“People need specific, achievable and approachable steps to feel that they can effectively mitigate flood risks. Otherwise, they are likely to avoid or deny them.”* (Park et al., 2020)
- To **combat cynicism** about the effectiveness of measures and possible **misinformation** – Lamond et al (2017) highlighted that anecdotal evidence of failed flood resilience measures – and a lack of successful examples of flood resilience measures - could negatively impact confidence in the measures.
- To **improve understanding of flood landscape / institutions and their respective roles**, which could contribute to people taking more individual responsibility. O’Sullivan et al highlight the lack of awareness of the roles of local and national flood risk authorities as a barrier to this shift taking place. They suggest communications could help and that *“Once roles and remits are clearly established in the consciousness of the general public, the responsibility of the public for self-protection can be differentiated from that of the flood risk management agencies.”* (O’Sullivan et al, 2012).

The latter point could help to address what is known as the ‘Samaritan’s dilemma’, where beneficiaries expecting aid after a disaster have less incentive to take action to reduce risk (Hanger et al, 2017, Buchanan J, 1975). If people understood that the Government or local authority are not responsible for property level protection generally, that could help motivate them.

Park, et al. (2020) state that behavioural science research shows that the complexity of decisions is a major barrier because the choices are complex and sometimes there are too many options. They recommend a number of things which could make PFR choices easier and which could be used to support people in building their knowledge:

- Reduce the number of options
- Standardise the presentation of the pros and cons and costs and benefits
- Provide decision aids (e.g. comparison tools and websites, decision trees), Kitemark or categorical labels (such as traffic lights and letter grades)

4.3.1 Providing support through valued advisors

The literature suggests that valued advisors may promote uptake of PFR measures among property owners by providing guidance, information and advice through the process, and thereby inciting confidence in the measures. When people feel unsure how to respond to a difficult situation such as flooding, they tend to delay the decision-making, and to be receptive to a trusted or expert advisor to lead the decision-making process (Philip, Dowds and Currie, 2020).

Park et al. emphasise the potential benefits of a “PFR surveyor” role in promoting uptake by providing an impartial assessment of the pros and cons of different rebuilding options; a clear presentation of the costs and benefits of different PFR measures; and decision aids such as comparison tools. This demand for impartial personalised advice on appropriate solutions is backed up by case study research in Aberdeenshire (Philip et al., 2020). Another study found that property adaptations are more often made where practitioners assist homeowners at an individual level, helping them create their own “coherent life stories” to deal with dilemmas such as natural hazards (Nakawaga, 2017).

A study undertaken in Seattle and Izmir on how to increase earthquake and home fire preparedness found that, while a resource intensive intervention¹¹ had a positive effect, there was also a significant increase in uptake of preparedness measures among the control group who experienced just the home visit and survey and the follow-up research. The authors concluded that these more limited interventions were in themselves effective motivators (Joffe, Perez-Fuentes, Potts & Rossetto, 2016).¹² This further highlights the

¹¹ This involved two three hour workshops, home visits including a survey, homework tasks and a Facebook group for social encouragement and support.

¹² This study and the ‘fix-it’ approach that was tested (encouraging people to secure and fix items in their home) used behavioural science as its basis. For the full article see: <https://link.springer.com/article/10.1007/s11069-016-2528-1>

impact of having an expert visit your property to assess and understand your specific situation in motivating action and encouraging self efficacy.

There is evidence indicating that insurers play a role in encouraging PFR measure uptake among homeowners by increasing knowledge and awareness. Hanger et al. (2017) found that insurance is positively associated with flood risk-reduction behaviour, with information provision on risk reduction being a possible explanation for this. This is corroborated by the finding that insured households show slightly better awareness of risks and flood hazard mitigation strategies (Kreibich et al., 2006, Surminski & Thieken, 2017).

Oakley (2018) considers Flood Re¹³ to have a central role in communicating information to households in the UK on the risks and damage caused by flooding, and the range and efficacy of resilience and resistance products that are available.

However, the style of information provision is also important. It is key that practitioners advising homeowners *listen* to households and develop a two-way channel of communication, rather than simply providing information alone (Nakawaga, 2017).

4.4 Key lessons

The literature and interviews both point to a need to prioritise building knowledge and skill among those at flood risk. The interviews suggests value in sources of neutral and expert advice – a single point of information to support them through the repair process. This could take the form of a website which is easily understood by a newcomer to the topic and helps direct people to other interventions which will support them in taking steps towards resilience. This could include: clear information on PFR options and the costs and benefits; where to find a valued advisor / PFR surveyor; where to find tradespeople that can install measures; how to apply for financial support, if available; and how to access local or online community group.

Another way to build skills would be through a specialist advisor or PFR surveyor role which supports people through the process of decision making and making resilient repairs. The home visits and face-to-face contact would be an opportunity for rapport building and instilling trust, and would therefore be more motivating than information provision alone.

The interviews also suggest a need to work with the insurance industry. Insurers currently play a key role in decisions, being in control of the costs and acting as the main source of information on what to do next (in the absence of other obvious sources of support) so hold substantial influence. The stage at which participants are offered a pay-out (or for repairs to be organised by the insurer) is a key decision point. If insurers were to offer a resilient

¹³ <https://www.floodre.co.uk/> Flood Re is a not-for-profit scheme, which launched on 4 April 2016 and is run and financed by insurers. The scheme caps domestic flood insurance prices keeping insurance premiums affordable for households in high-risk areas.

option at this stage, it would increase awareness and build knowledge of PFR. Financially incentivising 'building back better' could increase these benefits.

Given that the property Home Report is a key source of information for potential home buyers, this provides another opportunity to increase awareness of flood risk. This is covered in more detail in Chapter 9.

5 Making the benefits outweigh the costs

This section examines the ‘cost benefit’ calculations people must make when making decisions around flood preparedness and resilience, and the potential ways of overcoming the barriers identified in the literature. If a person has progressed along the first three stages of the Oakley Theory of Change, they will still need to make ‘cost benefit’ calculations before moving to the fourth stage – ‘I adopt resilience measures’.

5.1 Interview findings

5.1.1 Cost and cost-effectiveness

The interviews revealed that financial cost was a key barrier to uptake of PFR measures - and the expectation was that it would be fairly costly. There were two main perspectives on this.

One perspective was that PFR measures were a good idea in principle, providing they were affordable to flood victims (it was anticipated they would not be). As flood victims had overwhelmingly not been aware of their flood risk prior to their first flood, property repairs were not something they had anticipated having to pay for and therefore had not budgeted for. For some already struggling financially, their financial situation had been further weakened by the COVID-19 pandemic. These flood victims would consider PFR if financial support was available.

A second group of participants expressed a view that, even if PFR measures were affordable and potentially relevant to them, they may not be worth the expense. They questioned whether it was worth spending so much money on property repairs in any circumstance and felt that there was an upper limit as to what was “reasonable” to spend repairing a property, particularly if flooding was likely to happen (and cause disruption) again anyway.

“It’s important not to waste money doing too much - you can end up overspending to the point where it’s not worth it. Figure out a budget and stick with it – because you can get into spending too much because you could throw all your money into it. ”
(Female homeowner, 35-54, Hawick, fluvial flooding in 2019)

5.1.2 Efficacy of PFR measures

Given they were typically unfamiliar with PFR measures, participants felt they would need to be convinced of the efficacy of PFR before installing it. This could be aided by examples of properties similar to theirs where PFR worked well.

“I could be interested if it could be guaranteed that everything would be protected.” (Female homeowner, 18-34, Fife, surface flooding in 2019)

5.1.3 Aesthetics

Aesthetic considerations were a further barrier. Homeowners expressed concerns about how measures would affect the “look” of their home interior. Some specific examples of

aspects which were considered unattractive were given, such as sockets being repositioned high up the wall.

“It is pretty ugly having your power points up four feet or whatever the height would be, so I wouldn't find that particularly attractive in a living area, if it was in the kitchen it would be fine, but not in a living area. Also, I don't think I would necessarily want to have a tiled floor in the kitchen and the living area, you know, that wouldn't be my choice of material.” (Male homeowner, 55-64, Edinburgh, surface flooding in 2020)

In addition, beyond the appearance, concerns were also voiced about the durability and quality of PFR furniture being inferior to what they had currently.

“I'd want to know more about the flooring - not for aesthetic reasons but will it stand wear and tear, is it easy to clean, how different is it to what we have, and does it work.” (Female homeowner, 18-34, Fife, surface flooding in 2019)

5.1.4 Emotional cost

There was evidence of a huge emotional cost to flood victims around accepting water may enter their property again, as their experience of this had been traumatic. Beyond the practical disruption and upheaval, sentimental items, such as family photos had been lost and, when sewage had entered properties, victims had the added worry of associated health risks. In the most extreme cases, the trauma had resulted in people taking time off work and seeking medical treatment for depression and anxiety. The emotional leap of accepting the possibility of water re-entering the property was therefore overwhelming and unthinkable for some.

“It's frightening, every time it [heavy rain] happens. I'm just really worried all the time.” (Female homeowner, 70+, Edinburgh, surface flooding in 2019)

5.2 Summary of barriers

The findings from the interviews indicate that the key barriers may prevent the installation of PFR at this stage are:

- Financial cost
- Perceived cost effectiveness
- Uncertainty about the efficacy of measures
- Dislike of the aesthetics of measures
- Emotional costs

5.3 Interventions from the literature

5.3.1 Financial costs

The literature supports our findings that financial costs present a serious barrier for the uptake of PFR because measures can be expensive and can cost significantly more than standard ‘like for like’ repairs¹⁴. There is also an over-representation of vulnerable households in flood risk areas in the UK (Sayers et al., 2016), suggesting a high proportion are on a low income. Some studies have shown that income correlates with installing mitigating measures, but others contradict this¹⁵(Park et al., 2020).

5.3.2 Building financial incentives into the insurance system (a potential longer term solution)

Behavioural research provides clear evidence of the human tendency to value the present over the future, and to see losses as more significant than gains. This means people are unlikely to want to commit an upfront expense for an uncertain benefit (Kunreuther 1996). Furthermore, households can feel that they have adequately protected themselves by taking out insurance, so have a reduced incentive to install resilience measures (Oakley, 2018).

Some studies recommend building financial incentives into the insurance system. Hudson et al. undertook research into the trade-off between risk reduction and affordability in a model of public–private flood insurance in France and Germany. Their results indicate that insurance-based incentives are able to promote adaptation. The incentives could reduce residential flood risk by 12% in Germany and 24% in France by 2040 (Hudson et al., 2016).

Oakley considers a range of insurance related recommendations in his 2018 study for Flood Re. These include reduced premiums and excesses as an incentive to install PFR (which also requires improvements to how insurers assess the resilience of properties), and a ‘three strikes and you’re out’ approach to property owners being able to benefit from Flood Re¹⁶. While he believes these actions could have a small impact, Oakley argues that, for wholesale change, pilot schemes are needed to build on existing innovation and research. He recommends a raft of measures to change the public’s perception of flood resilience measures, improve community networks, change building regulations and introduce a flood resilience rating scheme (similar to Energy Efficiency ratings) (Oakley, 2018).

¹⁴ Estimates vary, but one study of resilient reinstatement in England found that it was between 23% and 58% more expensive than standard repairs, depending on the house type, and 34% more expensive on average (Joseph et al., 2011)

¹⁵ Thistlethwaite et al. 2018 (Canada), and Grothmann and Reusswig 2006 (Germany) found that higher income household were more likely take measures. However, Botzen et al., 2009a (Netherlands) and Lindell and Hwang 2008 (the US) did not.

¹⁶ The Flood Re scheme reduces the insurance premiums for those at risk of flooding via a re-insurance scheme. <https://www.floodre.co.uk/> A ‘three strikes and you’re out’ approach to property owners being able to benefit from Flood Re would involve encouraging property owners to install resilience measures after a flood, to allow them to continue to benefit from Flood re. If theytheir property is flooded three times and they still refuse to take measures, they would no longer be eligible for the scheme.

5.3.3 Offer grants and loans (in conjunction with other interventions)

The effectiveness of financial incentives in Scotland and the UK has not been widely researched. While we know financial support schemes (often for Property Level Protection generally, not specifically PFR) are offered in some parts of Scotland, there have been no recent evaluations of these. Eligibility for grants or loans also varies from place to place across the UK. Grants are often available to some areas after major floods, but they are usually not offered to those who wish to take preventative measures (Northern Ireland is the exception to this and now offers grants to those in high risk areas whose property has not yet been flooded) (Park et al., 2020). Park et al. also add that, because money from central government is distributed in different ways at a local level in the UK (meaning there are different eligibility criteria and ways to apply), it is more difficult for people to understand and access schemes.

Grants and loans may help increase the uptake of PFR if done in a way that can convince those at risk of **the efficacy and value of the measures** (Park et al., 2020). Grants have more appeal than loans in other contexts such as energy efficiency measures¹⁷. They also need to be accessible, clearly signposted and easy to apply for (Park et al., 2020).

While studies examining the retrofitting of energy efficiency measures in properties provide evidence of an increase in uptake and their effectiveness in ‘kick-starting’ interest (Kerr & Winskell, 2018 and Reineck, Suerkemper, Vondung, Thomas & Wörlen, 2020¹⁸), there appears to be little research on how the existence of long term financial assistance has shaped people’s attitudes towards such measures (including on whether their availability may reduce whether individual’s feel responsible for the installation of property measures).

In conclusion, the literature suggests that support to overcome financial barriers is key. Grants are more attractive, but loans may also help increase uptake. Changes to the insurance system may provide a long term way to build in a financial incentive. Overall, however, reducing or removing the costs to the property owner will have little impact if the other barriers are not also addressed at the same time.

5.3.4 Other costs

Aesthetics are another consideration in the costs versus benefits calculation people make when deciding on repairs. There is evidence that some people are put off by the look of certain measures and/or concerned that noticeable measures will reduce the value of their property when they come to sell it (Park et al., 2020). Suggestions for addressing this include building regulations make these measures mandatory or offering people more

¹⁷ A 2018 study published by ClimateXChange (looking at retrofitting of home energy efficiency measures) noted that loans are less attractive than grants - *Private household investment in home energy retrofit: reviewing the evidence and designing effective public policy*. N Kerr & M Winskell.

¹⁸ This study is a full evaluation of the German Federal Programme for Heating Systems Optimisation – it finds that the programme is effective in enabling behaviour change (and uses behavioural theory covered in this review) <https://energy-evaluation.org/wp-content/uploads/2020/07/eee2020-paper-reineck-christina-42-161-vondung-florin.pdf>

choice in the look of the measures being installed (e.g. different flooring options) (Lamond et al, 2017).

Emotional costs are thought to play a major role in decision making and resilience measures may be a more difficult concept to accept emotionally, because they require the acceptance of the risk, and the idea that water may enter the property (Park et al., 2020). Addressing this is complex - those at risk need to feel the peace of mind of PFR outweighs the anxiety of being more vulnerable to flood damage. As mentioned in Section 2, there can also be social costs influencing decisions because installing measures may mean going against the 'groupthink' of peers and neighbours. Communications (and other interventions such as community resilience groups and valued advisors) could address this by positioning PFR as the desirable social norm (Park et al, 2020).

5.4 Key lessons

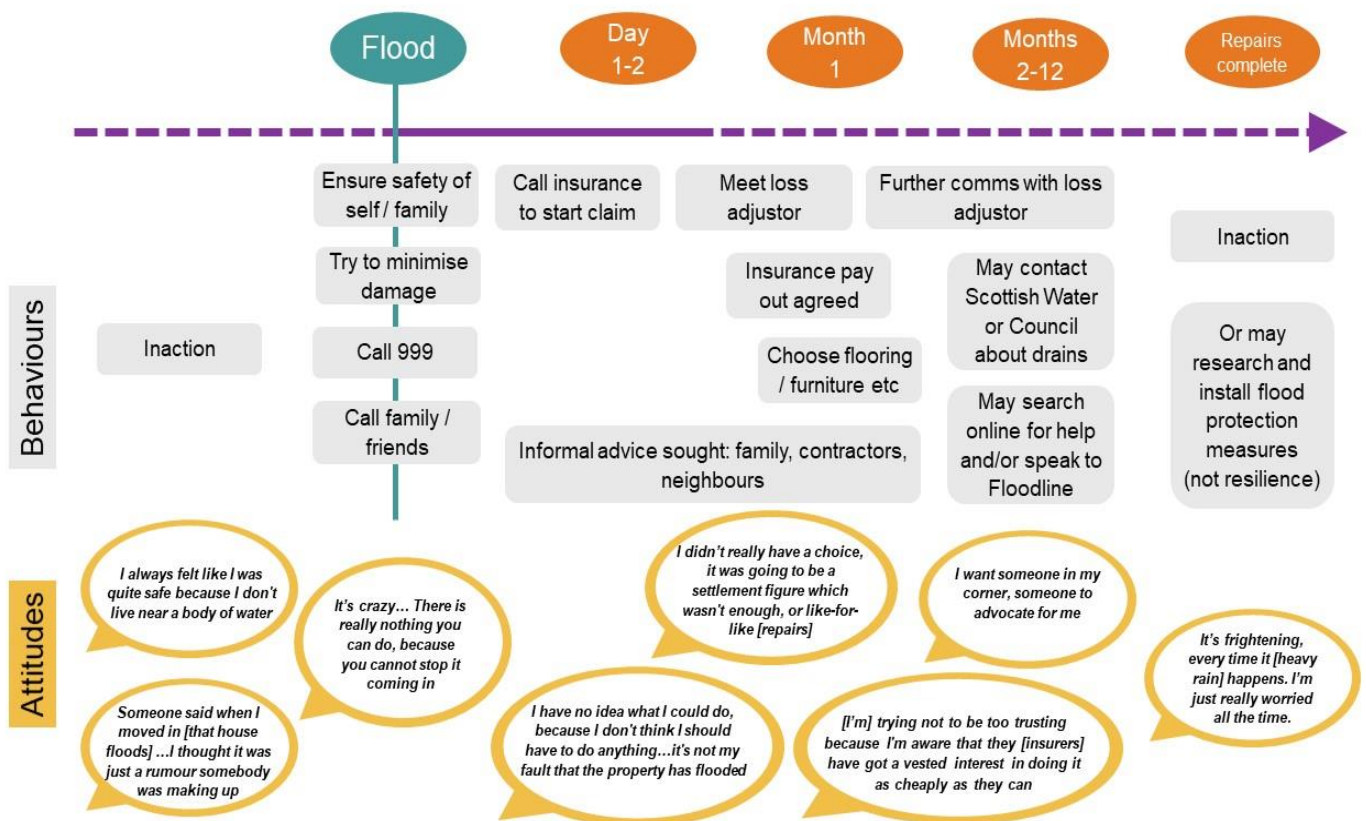
Both the literature review and the interviews reveal financial cost as a significant barrier to uptake of PFR measures. There could be considerable value in offering grants, subsidies or loans for PFR measures to flood victims and homeowners at flood risk. The interview findings also suggests a need to showcase successful and cost-effective PFR options, emphasising the efficacy of measures and savings made in future repairs, to encourage homeowners to perceive it as a worthwhile investment for their future. Trusted advisors could also play a role in helping people overcome emotional barriers towards PFRs and helping ensure any aesthetic costs and disruption are minimal.

6 Summary of participants' experiences

The diagram below brings together the findings from the interviews to provide an overview of the typical behaviours and attitudes of participants. While the sample size was small and predominantly comprised of those that had experience surface water flooding, there were many shared experiences, behaviours and attitudes.

Along this journey there are various decisions points. The two key points where there is potential to influence behaviours are inaction (which is a decision in itself) and the point at which people speak to their insurer about their repair (and pay out) options. We will revisit these in the conclusions section.

Figure 4: Overview of typical participant experience of property being flooded and rebuilding



7 Embedding in, and empowering communities

The following sections cover the findings from the literature which were not discussed explicitly in the interviews. This chapter focuses on what the literature had to say about embedding flood resilience in communities so that they feel empowered to take action. While the qualitative interviews did not cover this concept they did demonstrate an appetite for more knowledge sharing and support of any kind (emotional/social and practical). They also indicated a lack of awareness of existing Community Flood Action Groups (among the small and predominantly city based sample who took part).

7.1 Interventions from the literature

The literature emphasises the value of communities working together informally, and of community action groups, in promoting future flood preparedness in a wide range of ways:

- Informally **challenging denial** around flood risk and **advocating protective behaviours**. Evidence suggests that denial is a common first response to flood warnings (Drabek 2012), but that the perception of danger and interpretation of an appropriate response is heavily socially influenced. Thus, if homeowners see members of their community reacting to flood warnings, positive social norms are created, and they are much more likely to respond themselves (Park et al., 2020; McIvor and Paton, 2007).
- **Instilling a sense of individual responsibility to act** through promoting knowledge of responsibilities. Community Flood Action groups can increase residents' understanding of their own responsibilities and what they should do in a flood situation (Park et al., 2020).
- **Distributing information/guides** locally for residents about how to act in an emergency situation (Philip et al., 2020).
- **Building a sense of cohesion and cooperation** between affected residents. (Bihari & Ryan, 2012).
- Identifying, supporting, and promoting positive outcomes for **socially vulnerable members** of the community, who may otherwise be isolated and incapable of taking appropriate action alone (Park et al., 2020; Philip et al., 2020).

Case studies of flood events in England and Aberdeenshire have highlighted the positive role that **community organisations** can play in building cohesiveness for future flood preparedness (Park et al., 2020; Philip et al., 2020). However, there is little data on how widespread such groups are (Harries 2009).

There is evidence that, while people traditionally perceive flood mitigation measures as exclusively the responsibility of national and/or local government, a narrative of "co-produced" flood risk management, whereby individuals take joint responsibility *alongside* government actors may make individual responsibility more palatable, and encourage a greater take-up of PFR measures (O'Sullivan et al., 2012; Boelens et al., 2016).

Overall, the literature supports the creation and support of community flood action groups to instil a sense of responsibility to act through promoting knowledge of responsibilities; to informally challenge denial around flood risk; and to advocate / communicate protective behaviours.

7.2 Key lessons

The evidence review suggested that a greater number of community flood action groups in Scotland could help increase uptake of resilience measures.

There may be a particularly large gap for such groups in cities in Scotland. The ClimateXChange Baseline Study¹⁹ showed a high proportion of properties at risk within cities, and we did not find any existing flood action groups in urban locations during the recruitment for the interviews. There are also very few on the Scottish Flood Forum map of community groups they currently support.²⁰

The literature also supports the involvement of other existing community groups, and it emphasises the value of informal groups too. There may also be potential for home and business owners to provide information and support for each other in online spaces (e.g. forums or online events). While that may not bring a geographical community together, it would provide an opportunity for peer support on both the practicalities of becoming flood resilient and for emotional support.

¹⁹ <https://www.climatexchange.org.uk/research/projects/property-flood-resilience-scottish-baseline-study/>

²⁰ <https://scottishfloodforum.org/news/where-we-are-working/>

8 Ensuring the environment around people makes it easy

In this section we cover the interventions from the literature that focus on making the environment easier, so that deciding on and installing PFR measures is as straightforward and hassle free as possible. The data from the interviews showed that there were some concerns about the disruption of having PFR measures installed. However, this was not a particularly dominant concern, as participants were at an earlier stage of the Oakley Theory of Change.

8.1 Interventions from the literature

The literature showed that uptake of PFR measures may be improved by removing “friction costs”, which are commonly cited as barriers to the uptake of measures (Park et al., 2020). Friction costs (small points of hassle or inconvenience) can lead to a tendency to procrastinate actions where no natural deadlines exist and the motivation to start is weak. These include additional financial costs beyond the costs of the measures themselves (e.g. search costs, decision costs, installation costs); perceived dull, tricky or tedious tasks such as paperwork/administration, research and identifying tradesmen; and the prolonged time commitment involved in a multi-stage process (Philip et al., 2020). Friction costs can be mitigated through:

- **Removing, or assisting with, the financial costs** associated with the process through financial support which is accessible, clearly signposted and straightforward to apply for (as covered in Section 4 above).
- **Removing or reducing the level of hassle** from various stages of the process (e.g. applying for grants or loans, researching PFR options, identifying tradesmen for installation).
- **Use of valued advisors** (Section 5) – to guide people through the process, and make decision making easier and more straightforward.
- **Imposing deadlines for action** or harnessing timely moments when action is easier.
- **Prompting homeowners to take action**, and not to procrastinate, and simplifying the process for them with the use of prompts, reminders and checklists.
- This last point is connected to Oakley’s recommendations (covered in Section 3) around reducing the number of options, standardising how pros and cons / costs and benefits are presented and providing other decision aids such as a traffic light system (Oakley, 2018).

8.2 Key lessons

The low level of interest in resilience measures and number of large and complex barriers found in the interviews all suggest that reducing hassle at each stage of the journey is essential. Once a home or business owner recognises their property is at risk of future flooding, and that they are responsible for making it more resilient – they could still easily ‘fall off’ the journey along the theory of change if they run into difficulties.

Based on the interviews and the lessons from the literature, we suggest making information on flood preparedness easily accessible (and raising awareness of PFR in the first place); ensuring financial support is easy to understand and apply for; and that expert advice is also available to smooth out / facilitate the various stages of the process (particularly so that people feel confident about the efficacy of PFR measures) are critical factors in creating an environment that makes flood resilience easy to access.

9 Removing some (or all) of the decision making

The evidence review found a range of suggestions which involve taking some or part of the decision making away from the individual via changes in legislation or building regulations. These are outlined below. The interviews did not cover this area. However, the multiple and complex barriers found in the interviews would suggest removing some or all of the decision making by building flood resilience into certain regulations and legislation to make it the norm, could save individual home and businesses owners from having to be supported down a long road towards resilience.

9.1 Interventions from the literature

Some of the recommendations in the literature suggest that, while building knowledge and empowering people to make decisions is worthwhile, perhaps there is too much reliance on individuals in driving the changes required over the coming decades. This could mean shifting some of the decision making onto valued advisors, experts or champions, as discussed in Chapter 4. It could also be done via change in legislation and regulation. The following are examples of this type of approach which takes the emphasis away from individuals' choices through structural change:

- **A flood resilience (performance) certificate system** – to incentivise PFR being installed before a property is sold. (Oakley, 2018) This could use a rating system similar to current energy efficiency ratings. A new Canadian study also supports this type of approach and calls for mandatory disclosure of flood risk before any property is sold (Ziolecki, 2020).
- **Revision of building codes** and regulations – to ensure all properties in flood risk areas meet certain criteria. (Studies which support this include Kunreuther, 1996, Spence, 2007 and Brilly, 2005).
- **Resilient reinstatement for insurance claimants** – particularly as insurers play a central role in the repair process, and there are low levels of awareness and knowledge of PFR among the public. This may be difficult to achieve given the higher costs of PFR, and because it is not something the UK insurance industry has offered historically. In 2019 The Association of British Insurers said that resilient repairs are considered an investment in the property that would not normally be funded (Park et al., 2020). However, the current Defra consultation on the future of Flood Re proposes changes to the insurance sector.²¹

9.2 Key lessons

All of the approaches to remove or reduce decision making identified in the literature could potentially help overcome the barriers to uptake in Scotland. Examples which could work in Scotland include: A flood resilience (performance) certificate system (covering levels of flood risk and a resilience rating) - which could form part of Home Reports; revision of building codes and regulations (aiming to ensure all properties in flood risk areas meet certain criteria); resilient reinstatement for insurance claimants; and support from specialist advisors / PFR surveyors to support people throughout the process.

²¹ <https://consult.defra.gov.uk/flood-insurance-preparedness-team/amendments-to-the-flood-re-scheme/>

10 Conclusions and recommendations

10.1 The challenge

The property and business owners we spoke to were at an early stage on the journey to making their properties resilient. Although their property had previously been flooded (and they knew what it was like to suffer significant damage to their property), their responses to the idea of PFR were not positive, overall, and the barriers that were apparent were complex and not easily overcome. If we were to map participants onto the Oakley Theory of Change they would, on the whole, be at stage one (I know a flood might affect me) or between stages one and two (I feel able to take action and responsible for taking action). While this was a small interview sample, and most interviewees had experienced surface water flooding, the high levels of consensus among participants in their reactions to PFR point to much needing to change before homes and businesses at risk in Scotland are made resilient.

However, the evidence review also demonstrates that looking internationally, there are few examples where interventions have made great inroads in increasing flood preparedness. Scotland has a long way to go, but so do most other nations. Taken together the interviews and the evidence review show that there is no single or quick fix to increase PFR uptake – what is required is a series of interventions to tackle multiple and complex barriers. These must meet people at whatever stage they are at on the journey towards resilience.

10.2 Recommendations for first steps

While we found many interventions and initiatives in the literature that could potentially make a difference in Scotland, we have used the interview findings to help prioritise these and suggest practical next steps. Accelerating the uptake of PFR measures is important now for those properties currently at risk, and will become even more important as climate change increases flood risk over the coming decades.

There are two main tasks for the next steps:

- a) To raise awareness of flood risk and of PFR; and to get people to accept flood risk, understand that PFR is relevant to them, and to recognise their role in improving the resilience of their property (i.e. the attitudinal changes needed at stage one in the Oakley Theory of Change)
- b) To support people so they feel able to take action and are able to access and assess the available options (i.e. supporting those in stages two and three in the Theory of Change)

Although only a small number of interviews were undertaken as part of this study, there was enough consensus for us to make the following recommendations. Findings are more reflective of the attitudes of those who have experienced surface water flooding, than those whose property was flooded by river water. However, it should also be noted that the

attitudes of the two participants who had experienced river flooding were broadly in line with those who had experienced surface water flooding. Despite this skew towards the experience of surface water flooding, the recommendations are still relevant given the large number of properties at risk of this type of flooding (over half compared with just over a third at risk of fluvial flooding²²) and the ongoing increase in extreme weather events due to climate change.

We recommend the following steps to meet the main tasks outlined above (roughly in order of priority):

1. Make flood risk, flood preparedness and resilience information more accessible online:

There are already various online resources which property owners could use to assess risk and to find out about Property Level Protection and, to a lesser degree, PFR measures.²³ However, interview participants who had searched for information had not typically found what they were looking for, suggesting that the existing information is not easily accessible via internet searches.

We therefore recommend that current content is reviewed and refreshed in order to improve searchability and accessibility of information, and to incorporate some of the messaging covered in recommendations 2 and 3 (below).

Refreshed online information on flood risk and resilience has the potential to tackle a number of the barriers identified in the interviews (such as doubt about efficacy of measures, and lack of awareness or acceptance of their responsibility to make their property resilient). To do this it needs to: provide trusted information; allow people to understand the risk to their property; explain what PFR is and the benefits; show practical examples of resilience measures working; and reinforce messages around property owners' responsibility and the role of other agencies. Together this aims to make people feel they can take action and make it clear what their options are. This online information also needs to direct people to other support as it becomes available (e.g. grants, trusted advisors and community groups).

This refresh will need to include an audit of existing information, content development, user testing and Search Engine Optimisation work to ensure the terms people are searching for get them to the information they need. This has been included as a priority recommendation to ensure online resources are optimised before awareness raising activities are launched.

²² <https://www.climatechange.org.uk/media/4182/property-flood-resilience-scottish-baseline-study.pdf>

²³ Existing websites include: The Scottish Flood Forum, SEPA flood map pages, [MyGov emergency information pages on flooding](#), National River Flow Archive (NFRA), and Mary Dhonau Associates.

2. Awareness raising activities aimed at those at risk (and those who will be due to climate change):

These activities need to increase awareness of flood risk and of PFR among those at risk now (as per the 81,000 households cited in ClimateXChange's Baseline Study) and, given the climate crisis, those who will be at risk in the future. Targeting those 'at risk' and 'future risk' groups is challenging from a behaviour change perspective (given low/no awareness of PFR and the dominant cultural and social norm of inaction), but it is required to start to raise awareness, shift social norms, and promote preparedness for increasing extreme weather events. This would mark a step away from the long established approach in the UK and elsewhere of mainly providing help reactively (information, grants etc) in the aftermath of a flood.

Communications have a key role in this. A broad range of channels need to be considered including mass media advertising and use of local 'touchpoints' (e.g. libraries). Media communications (e.g. advertising, leaflets etc) can raise awareness of the devastation flooding can cause, encourage people to check their risk, and think about flood preparedness. Content needs to be emotive and focus on the severity of flooding rather than the likelihood of it happening. Messages need to evoke a 'fear response' while also providing clear signposting to what can be done - so that people feel they can do something and it will make a difference. It will be important to avoid making people feel like the burden of responsibility for flood preparedness is being placed solely at their door. To address that, messages need to clarify roles and responsibilities in a way that demonstrates that authorities are also playing their part. Messages may resonate more if particular messengers are used – such as familiar faces (celebrities), experts, converts to PFR and government messengers. Obviously this will require research and testing to ensure campaigns are effective.

Awareness can also be raised at set points where property owners have to come into contact with authorities or organisations. This could include the Police, the Fire and Rescue Service, community councils and local authorities. Consistent messages and signposting from these sources would help provide support, promote PFR and avoid confusion. The insurance industry may also be able to raise awareness among this wider audience (despite them not having experienced flooding or made a claim). This is discussed further in Recommendation 6.

The interviews demonstrated that flood victims did not tend to report receiving information about their property's flood risk when they purchased their property. Developing a flood resilience (performance) certificate system could be one way to introduce risk and resilience to all property buyers and vendors in flood risk areas. This could be integrated into the current Home Report system and is included in medium term recommendations, see section 10.3 below.

3. Awareness raising, information and support - aimed at those whose property had been flooded:

The interviews and the literature support targeting those who have experienced flooding as soon as possible after the event. The interview findings showed that this group felt unsupported during what they described as a very traumatic time. It is at this stage people are most in need of information and support and when they may be most likely to consider PFR measures. This could be done by providing information through the organisations people contact when their property has been flooded (as mentioned above - such as local authorities, the Police, the Fire and Rescue Service etc, and Floodline Scotland and the Scottish Flood Forum).

Again, messaging needs to be carefully considered so that it does not leave people feeling that responsibility is being passed to them by the authorities. The view that PFR is not relevant because outside agencies need to improve the drains, was also prevalent. This will need to be addressed with messages that demonstrate that multiple agencies are taking action to mitigate the effects of increases in extreme rainfall, and property owners have a role in this too. A positive and supportive 'we're in this together' type message could help property owners feel that there is help out there and, crucially, that they also have a responsibility to take action to reduce damage in the future. The recommended stage for these communications is in the immediate aftermath of a flood. While this is a good point in time for levels of motivation and from a practical perspective (as repairs need to be done anyway), there is also often the desire to get 'back to normal' as soon as possible, and the costs and complexities of PFR can be off-putting.²⁴ These factors need to be kept in mind in the planning of communications and support post-flood. A further key stage to push these messages is when plans for repairs are being discussed with an insurer.

4. Provide grants and loans for resilience measures.

Given financial costs were a major barrier, and the need to commit upfront expense for a long-term and uncertain benefit can deter action - a widely publicised grant or loan scheme could help increase uptake. This could be available for both those at risk and those who have already experienced flooding. The evidence review showed that Northern Ireland is currently the only part of the UK which offers financial support for flood preparedness before flooding has occurred. Learnings from England suggest that a national scheme for Scotland may be the most effective approach - because schemes being run by local authorities across England offer different amounts and use different eligibility criteria, which adds to confusion about what is available.²⁵ Grant schemes need to be easy to apply for and need to be promoted with clear and consistent messages. However, in deciding on design of future schemes there is a need to evaluate completed/existing grant schemes

²⁴ See p47-8 of the 2020 Environment Agency Review:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913967/Applying_behavioural_insights_to_property_flood_resilience_-_report.pdf

²⁵ See p46 of the 2020 Environment Agency Review:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913967/Applying_behavioural_insights_to_property_flood_resilience_-_report.pdf

(see suggested further research below) to understand more about the impact they could have. Any grant scheme could be linked to similar 'climate' or 'green' grant schemes associated, primarily, with carbon reduction through home insulation improvements, boiler efficiency and renewable energy generation.

5. Provide trusted advisors / PFR surveyors.

The interviews showed that when PFR is introduced as a concept, people have many questions and/or doubts about whether measures were suitable for their property, and about the efficacy of the measures themselves. The evidence review also highlighted that when faced with a complex decisions, people may delay decisions making. There is, therefore, a need for this level of support to help empower people and provide ongoing support in their journey from inaction towards resilience. The interviews also demonstrated a clear appetite for a single point of contact who can be trusted to provide impartial advice to support people in becoming flood resilient. Face-to-face contact should be involved as this will help build trust. The literature supports the provision of advisors that can give an impartial assessment of the pros and cons of different rebuilding options; and a clear presentation of the costs and benefits of different PFR measures. This role has the potential to make a considerable difference to the traumatic and stressful experience of being a property being flooded, and could also provide a level of technical and bespoke advice not possible on a website.

6. Engage the insurance industry to promote PFR as an option.

This could be extremely beneficial given their highly influential role in determining what repairs are done. If insurers were able to offer resilient repair options (even at an extra cost), it could have a significant impact on awareness of and interest in PFR. Better still, if they financially incentivised the uptake of PFR measures, there could be a real increase in uptake. This would take advantage of the key decision point where property owners defer to insurers to lay out their possible repair options. We know that insurers in the UK generally do not offer resilient options. The Association of British Insurers said in 2019 that resilient repairs are considered an investment in the property that would not normally be funded. However, changes may take place after the consultation on the future of Flood Re, which affects the broader UK insurance landscape. There were also examples in the literature for other European countries where the insurance industry had been successfully engaged in promoting and financially incentivising PFR.²⁶

²⁶ See p48 of the 2020 Environment Agency Review:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913967/Applying_behavioural_insights_to_property_flood_resilience_-_report.pdf

[SURMINSKI, S. AND THIEKEN, A. H. 2017. *Promoting flood risk reduction: the role of insurance in Germany and England.* https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017EF000587](https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017EF000587)

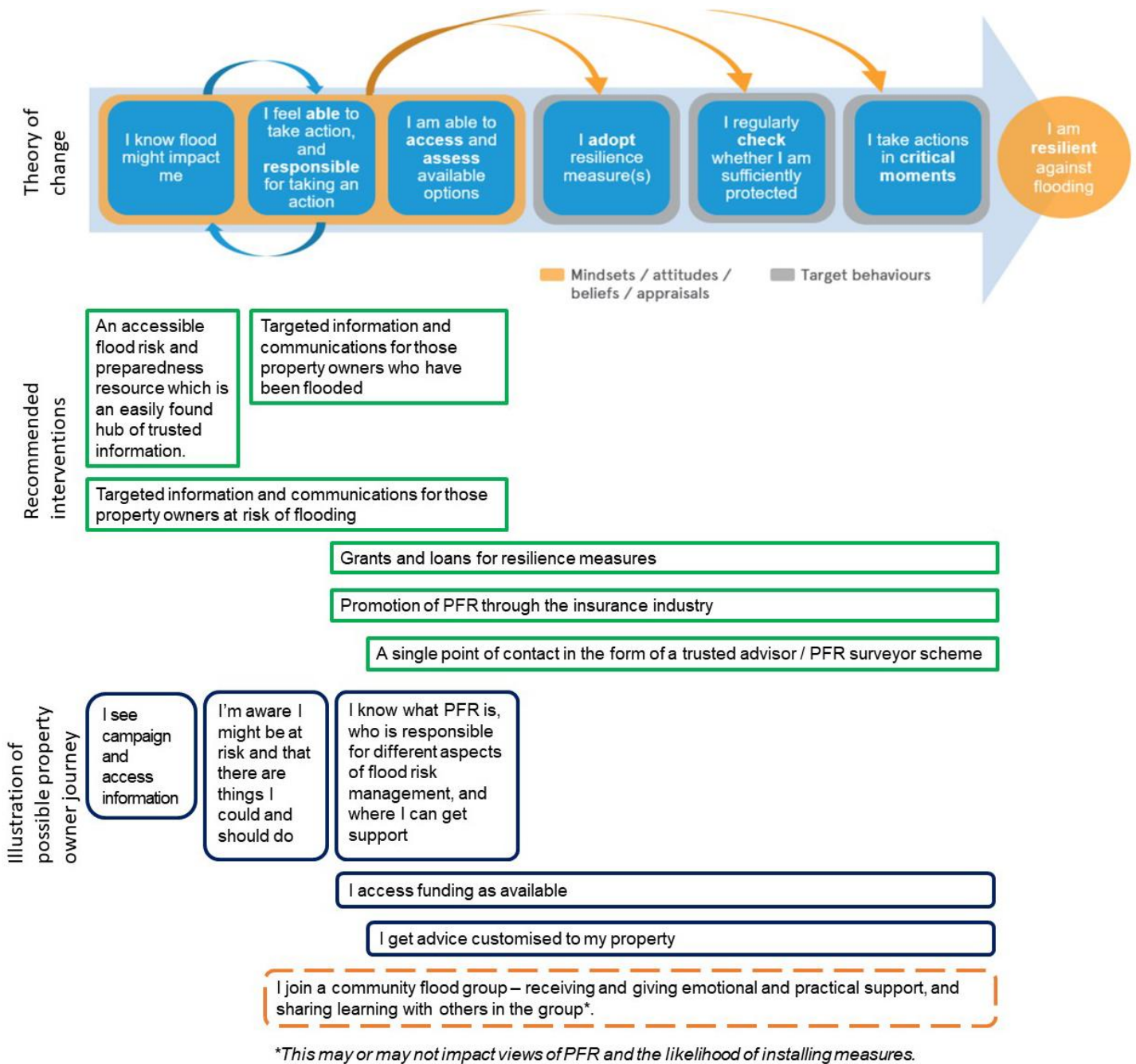
[HUDSON, P. et al. 2016. *Incentivising flood risk adaptation through risk based insurance premiums: Trade-offs between affordability and risk reduction.* https://www.sciencedirect.com/science/article/abs/pii/S0921800916301240](https://www.sciencedirect.com/science/article/abs/pii/S0921800916301240)

As mentioned above, communications with those at risk before flooding could help shift people along the theory of change. There may be a role for insurers to raise awareness of risk and PFR at stages other than during a claim. This could involve them being pro-active in promoting flood preparedness among customers and signposting further information and support on resilience measures.

The six recommendations above are actions to be prioritised. Appendix 1 provides further detail on how these can be implemented. Table 4 (in Appendix 1) maps the barriers discussed in each chapter and provides insight into how behaviour change theory can help inform the design of any potential interventions.

The following diagram illustrates what possible journeys from inaction to installing PFR measures might look like. We have provided this as a summary of key recommendations, but also to point out that, because the barriers are multiple and complex, a combination of interventions will be needed for each property or business owner. The diagram also provides an overview of the behaviours and attitudes each intervention is trying to achieve. People's actual journeys may be more complex and less linear than the figure is able to capture. For example, the existence of grants and/or loans could encourage property owners to seek customised advice, or they could be made aware of the existence of grants and loans as part of the customised advice.

Figure 5: Summary of recommended interventions



10.3 Medium term recommendations

As noted above there is no single or quick fix to increase PFR uptake. While we believe the priority recommendations would have the greatest short term impact on moving property owners along the theory of change and in taking responsibility for the flood resilience of their properties, the following should be explored in the medium term (further details on all recommendations are in appendix 1):

- **Simplify information** for home and business owners – provide decision aids to help people decide on measures (traffic light system, Kite mark). Standardise how the pros and cons / costs and benefits are presented.

- Create and support more **Community Flood Action groups** (these could be physical or online groups providing peer support and sharing information).
- **Legislative and regulatory changes.** Which could include:
 - **A flood resilience (performance) certificate system** (e.g. Home Reports which show the flood risk level and the resilience of a property)
 - **Revision of building codes and regulations** – aiming to ensure all properties in flood risk areas meet certain criteria.

10.4 Further action

As stressed in this report, a series of interventions is needed to tackle multiple and complex barriers to the uptake of PFR. The literature suggests it is important to empower communities, and to create an environment around property owners that make uptake of PFR measures the easy choice. This suggests that in addition to the recommendations made based on the interview findings, a number of areas need further action and research.

Empowering communities

This study has not mapped community flood groups or other neighbourhood groups that may play a role in accelerating the uptake of PFR. Equally there may be a role for Fire and Rescue and other local services that have a role in helping communities and property owners take preventative action, and in responding to emergencies.

It would be valuable to consider how these many groups and networks can be facilitated and supported, and how they can support each other in their various roles in relation to those whose property is at risk of flooding and those whose property has been flooded.

Working with the insurance industry

The insurance industry plays an important role in in the repair process, but those interviewed reported only being offered 'like for like' repairs.

Further research is needed into how other jurisdictions have engaged with insurers to inform how this can be approached in Scotland. Case studies from France and Germany may provide useful starting points.²⁷ In addition, it would be beneficial to understand whether insurers in other countries have pro-actively promoted resilience (pre-flood and pre-claim).

²⁷ See HUDSON, P. et al, 2016. Incentivising flood risk adaptation through risk based insurance premiums: Trade-offs between affordability and risk reduction.

<https://www.sciencedirect.com/science/article/abs/pii/S0921800916301240>

For further information on barriers to UK insurers promoting PFR, see p48 of the 2020 Environment Agency Review:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913967/Applying_behavioural_insights_to_property_flood_resilience_-_report.pdf

It would also be useful to consider how the insurance industry could promote and offer resilient repair options, bearing in mind the Defra consultation on Flood Re and the planned transition to a “risk-reflective flood insurance market.”²⁸

Financial support

There is a need to evaluate existing PLP and/or PFR schemes in Scotland. Our interviews indicated that cost is a driving factor in repair decisions. This should include assessing the impact of financial assistance on people’s attitudes towards PFR measures (or in other areas, such as energy efficiency), and whether they feel less responsible for paying for adjustments to their property if grants are available in the long term.

Robust data on the benefits of loans versus grants in property adjustment schemes should inform how any future PFR schemes are designed and rolled out, locally and nationally.

Expert valued advisors / PFR surveyors

One of the recommendations above is to provide trusted advisors/PFR surveyors. Table 4 (appendix 1) sets out how such a role could help overcome a number of the barriers identified in the interviews and the literature. However, the design of such a scheme will need further research, e.g. into learning from any similar systems, to determine the required level of contact and support, and to identify the skills, technical and softer skills, needed in the role.

²⁸ <https://consult.defra.gov.uk/flood-insurance-preparedness-team/amendments-to-the-flood-re-scheme/>

11 Appendices

Appendix 1 Identified barriers and possible interventions

The table contains more detail on the recommendations above. It maps the barriers and interventions using the ISM behaviours change model. It also utilises the MAPPS behaviour change model to provide further information on what interventions need to do to bring about new behaviours. It is important to note that none of the suggested policy ideas below were discussed in detail with participants of this study – they are suggestions based on our understanding of the barriers to uptake and existing literature.

Table 4. Identified barriers and possible interventions

	Key Barriers	Related ISM factors	MAPPS Intervention Principles	Key recommendations and MAPPS behaviour change principles (Priorities for short to medium term)
Accepting risk and responsibility (Chapter 3)	<p>Lack of awareness and/or acceptance of flood risk</p> <p>Lack of acceptance of responsibility</p> <p>Perceived lack of relevance (because only external / hard engineering seen as solution)</p>	<p>I: Emotions, Values / beliefs / attitudes</p> <p>S: Opinion leaders, Norms, Roles and identity</p>	<ul style="list-style-type: none"> • Capability: How can learning be made relevant, timely, and experiential? • Self-efficacy: How can a sense of confidence / mastery be built up from experience or through persuasion? • Internalisation: How can a sense of personal motivation be developed? • Social Norms: Can installing PFR measures be conveyed as the 	<p>Targeted communications / awareness raising activity to: raise awareness of risk emotively enough to bring about action; raise awareness of PFR; help people see relevant and tangible benefits or mitigation of risks in measures; clarify where responsibility lies – helping people see the work being done by others (including government / other external agencies) creating a ‘we’re in this together’ positive and empowering message (that helps people accept they have some responsibility, as well as the authorities); normalise the uptake of PFR measures; and make people feel they can do something and that it will be effective.</p> <ul style="list-style-type: none"> • Who: Target those whose property has been flooded to offer support and show them they could benefit from resilient repairs; AND a broader campaigns to target all those at risk (and that will be at risk in the future) to raise awareness around preparedness and responsibility.

			<p>expected thing that others do?</p> <ul style="list-style-type: none"> • Identity: How can adopting PFR be linked through to existing salient identities? 	<ul style="list-style-type: none"> • How: Choose messengers who reflect the identities of those being targeted to deliver communications e.g. converts, experts or familiar faces. Emphasise the probability of the risk less and focus more on the severity of flooding, making flooding relevant to them. Make use of other opportunities where property owners have to come into contact with authorities or organisations (e.g. community council, local authority, when property purchase is being made – e.g. via Home Reports) • When: General awareness raising – year round or after flooding has been in the media and at key touchpoints suggested. Plus targeted communications for those affected by flooding – immediately after the flood.
<p>Knowledge and awareness of PFR (Chapter 4)</p>	<p>Lack of confidence / knowledge of PFR measures and benefits</p> <p>Low levels of awareness and understanding of PFR, and of the landscape generally</p> <p>Lack of clear and accessible information on PFR product / measures (what to buy and how to use)</p> <p>Emotional costs</p> <p>Friction costs</p>	<p>I: Skills / knowledge, Values / beliefs / attitudes / Agency / confidence (lack of)</p> <p>S: Opinion leaders</p>	<ul style="list-style-type: none"> • Capability: How can learning be made relevant, timely, and experiential? • Self-efficacy: How can a sense of confidence / mastery be built up from experience or through persuasion? • Processing: How can information be aligned with the level of knowledge of the users? Can clearer signposting be provided where more advanced knowledge is needed? 	<ul style="list-style-type: none"> • Online resource to Make flood risk, flood preparedness and resilience information more accessible. Should provide trustworthy, neutral, accessible sources that empower decision making and clarify roles / responsibilities. A single source of information to support them in repairing after a flood or becoming more resilient once they know they are at risk. Improve SEO. • Trusted advisors / PFR surveyors to support people throughout the process of decision making and getting resilient repairs made (home visits and face-to-face contact – more motivating than information provision alone). Ensure communication is two-way and that advisors provide support by listening, rather than just delivering information and advice. • Simplify information for home and business owners – provide decision aids to help people decide on measures (traffic light system, Kite mark). Standardise how the pros and cons / costs and benefits are presented.

<p>Making the benefits outweigh the costs (Chapter 5)</p>	<p>Financial costs Emotional costs [Idea of water getting in (again) is traumatic, prefer not to think about or focus on PLP or hard engineering solutions] Social costs Dislike of aesthetics of PFR equipment</p>	<p>I: Costs & Benefits, Skills S: Norms, Tastes-</p>	<ul style="list-style-type: none"> • Environmental: How can the environment be made more supportive by removing additional financial / resource costs? • Processing: How can information be aligned with the level of knowledge of the users? Can clearer signposting be provided where more advanced knowledge is needed? • Outcome expectations: How can relevant and tangible benefits or mitigation of risks in measures be made more salient / observable? • Social norms: Can installing PFR measures be conveyed as the expected thing that others do? • Identity: How can adopting PFR be linked through to existing salient identities? 	<ul style="list-style-type: none"> • Offer grants and loans (that are simple to apply for and deliver consistent messages across Scotland on how to apply, eligibility etc). This needs to happen in conjunction with other interventions. • Build financial incentives into the insurance system (a potential longer term solution). • Promote PFR as the desirable social norm (e.g. highlighting that other people are taking the risk seriously). • Showcase successful and cost-effective PFR options in communications, emphasising savings made in future repairs to encourage homeowners to perceive it as a worthwhile investment for their future. • Expert valued advisors / PFR surveyors could also play a role in helping people overcome emotional barriers towards PFRs and helping ensure any aesthetic costs are minimal.
<p>Embedding in and empowering communities (Chapter 7)</p>	<p>Lack of support / support network Lack of expert advisors Emotional costs</p>	<p>S: Norms, Roles and identity, Opinion leaders, Networks and relationships</p>	<ul style="list-style-type: none"> • Identity: How can adopting PFR be linked through to existing salient identities? • Social norms: Can installing PFR measures 	<ul style="list-style-type: none"> • Create and support more Community Flood Action groups to instil a sense of individual responsibility to act through promoting knowledge of responsibilities. Also support / facilitate flood resilience via existing community groups and networks. Ensure there are groups in urban

	<p>Low levels of awareness and understanding of PFR, and of the landscape generally</p>		<p>be conveyed as the expected thing that others do?</p> <ul style="list-style-type: none"> • Processing: How can information be aligned with the level of knowledge of the users? Can clearer signposting be provided where more advanced knowledge is needed? 	<p>areas and look at the creation of online spaces for peer support among those that have been affected by flooding.</p> <ul style="list-style-type: none"> • Distribute information/guides locally for residents about how to act in an emergency situation. • Identify, support, and promote positive outcomes for socially vulnerable members of the community, who may otherwise be isolated and incapable of taking appropriate action alone.
<p>Ensuring the environment around people makes it easy (Chapter 8)</p>	<p>Time costs, friction costs (hassle factor) Low levels of awareness and understanding of PFR, and of the landscape generally. Lack of clear and accessible information on PFR products / measures (what to buy and how to use).</p>	<p>M: Technologies, Objects, Time and schedule I: Costs & Benefits</p>	<ul style="list-style-type: none"> • Environmental: How can the environment be made more supportive by removing additional financial / resource costs? • Processing: How can information be aligned with the level of knowledge of the users? Can clearer signposting be provided where more advanced knowledge is needed? • Outcome expectations: How can relevant and tangible benefits or mitigation of risks in measures be made more salient / observable? • Self-efficacy: How can a sense of confidence / mastery be built up from experience or through persuasion? 	<ul style="list-style-type: none"> • Critical points where making things easier could have an impact: remove or assist with financial costs; ensure financial support is easy to understand and apply for; make information on flood preparedness easily accessible; make expert advice available to smooth out / facilitate the various stages of the process (particularly so that people are not put off by the confusing choice of measures and can feel confident about the efficacy of them). • Prompt homeowners to take action, and not to procrastinate, and simplifying the process (prompts, reminders and checklists). • Simplify and standardise how information is provided (as mentioned above).

<p>Removing some (or all) of the decision making (Chapter 9)</p>	<p>Various (this topic looks at addressing all the barriers associated with individuals making the decisions around PFR)</p>	<p>Various</p>	<ul style="list-style-type: none"> • Environmental: How can the environment be made more supportive by removing additional financial / resource costs? • Processing: How can information be aligned with the level of knowledge of the users? Can clearer signposting be provided where more advanced knowledge is needed? 	<ul style="list-style-type: none"> • A flood resilience (performance) certificate system (e.g. Home Reports which show the flood risk level and the resilience of a property) • Revision of building codes and regulations – aiming to ensure all properties in flood risk areas meet certain criteria. • Resilient reinstatement for insurance claimants. • Trusted advisors / PFR surveyors to support people throughout the process (as mentioned above)
---	--	----------------	--	---

Appendix 2: Detailed method for the rapid evidence review

Initial searching

The first stage of this rapid evidence assessment was to familiarise ourselves with the existing literature and establish how far back to search. Initial searches were undertaken covering floods, other hazards and property level measures including the terms resilience / resilient. These initial findings were discussed with ClimateXChange and the Scottish Government and the search criteria detailed in Section 1.2 were established. It was agreed that literature from the last 15 years may be relevant, given the specialised nature of the search.

We then undertook a review of the newly published, and highly comprehensive, Applying behavioural insights to property flood resilience, from the Environment Agency in England and Wales (Park, Oakley & Luptakova, 2020). From this, we identified further areas of interest (these were informed by the suggestion of areas for future research from the appendix of Park, Oakley & Luptakova, 2020). The six step theory of change to installing and maintaining PFR (Oakley, 2018) included in this review enabled us to identify the stages of the journey towards flood resilience to focus on.

A further area of interest identified by ClimateXChange and the Scottish Government (which stood out as a significant barrier to implementation of PFR, and on which there appeared to be minimal evidence), was ways of shifting attitudes towards taking responsibility as individuals for measures, rather than deferring to the State or other outside agencies.

Main search

- Various combinations of the following search terms were used to identify over 30 studies which looked potentially relevant:
- “Successful” / “Effective” / “What works” / “Barriers to” / “Interventions” / “Initiatives” / “Policies” / “Schemes”
- + “Communicating” / “Encouraging” / “Promoting/promotion of” / “Increasing” / “Incentivising”
- + “Uptake of” / “Responsibility” / “Awareness” / “Risk” / “Action” / “Behaviour”
- + “Mitigation” / “Adaptation” / “Resilience” / “Improvements” / “Protection”
- + “Flooding” / “Floods” / “Earthquakes” / “Wildfires” / “Hurricanes” / “Natural Disasters” / “Natural Hazards” / “Risks”
- + “Measures” / “Rebuilding” / “Adaptation” / “Repairing”
- + “Property owners” / “Homeowners” / “Businesses” / “Individuals” / “Households” / “Citizens”

Data mapping and refining

The next stage was to log the results in a detailed mapping document. The mapping document collected a number of details about each study including:

- Study name
- Date of publication
- Organisation responsible for study
- Methodological details

- Topic coverage / abstract

A more thorough review of the studies was then undertaken, and a summary of key relevant points was added to the mapping document. We reviewed the quality and relevance of the studies and excluded some on the basis that they did not fully meet all the agreed criteria. All the studies included were either peer reviewed academic papers, government publications, or grey literature which the project steering group had highlighted as being useful and relevant. Thirty-one studies were included in the final list.

Analysing and reporting

Analysis of data was undertaken by grouping together findings on similar types of interventions. These led to the development of the main chapter headings of this report. For each chapter / theme, the relevant studies were reviewed in more detail and the findings collated to form an overall narrative across the literature. This included pulling out the recommendations from the literature and some of the key behavioural science theory supporting them.

Appendix 3: In-depth interview discussion guide

<p>1. Introduction</p>	<p>Timings and coverage (60 min total)</p>
<ul style="list-style-type: none"> ▪ Introduce self and Ipsos MORI ▪ Check in with how they are – realise it's a tricky time at the moment with all the changes to everyone's lives because of Coronavirus. Is now still an OK time to speak to us? <p>Introduce the research: We are undertaking this research with the University of Edinburgh for The Scottish Government to understand the decisions people make about repairing their property/business premises after they have been flooded (or had their property surveyed for property level flood products). The anonymised findings will be published in a report next year. The report will be used by The Scottish Government to help.</p> <ul style="list-style-type: none"> ▪ Explain that the interview will last about 45 minutes to an hour. Remind them they will get £30 to say 'thank you' (we can do this as a BACS transfer or an Amazon or high street voucher) <p>CONFIRM ETHICAL STANDARDS:</p> <ul style="list-style-type: none"> ▪ Just to remind you, participation in this research is entirely voluntary. You can stop the interview at any time and, if there are any questions you don't want to answer, that's fine. ▪ What you tell us during this interview will remain anonymous. This means that in the report we produce it will not be possible to personally identify you from the responses you give in this interview. ▪ We hold your personal data (like your email address and phone number) securely and will not share it with anyone. The data we collect from you during this research will be securely deleted from our systems 3 months after the report is published ▪ We have a privacy notice that outlines more about how we use and store your data, which I can send you if you haven't read it already. ▪ Does that all sound okay to you? Do you have any questions for me before we start? <p>CHECK RECORDING PERMISSION AND RECORD CONSENT:</p> <ul style="list-style-type: none"> ▪ Before I start recording, can you confirm that you are happy for me to record what we are both saying? START RECORDING: ▪ And can I just ask you to confirm for the recording that you are happy to proceed based on the information I just provided? 	<p>2-3 min</p>
<p>2. Warm-up and context</p>	<p>5 minutes</p>
<p>To start us off, can you tell me a bit about you / and your business</p> <p>HOMEOWNERS ONLY</p> <ul style="list-style-type: none"> - Where you live, how long you've lived there - Who you live with - Are you currently working? - What kind of property you live in - What you like about living there - How many times have you been flooded there as a result of weather (.e.g. not burst pipes)? - When was the last time? <p>BUSINESS OWNERS ONLY</p> <ul style="list-style-type: none"> - Your business – what you do, how long you have been running it, size - What kind of property it is based in - How long you have been based there - How many staff work in the property - How was the business doing before the COVID 19 crisis? - And how has it been for you since March? [changes / challenge] 	<p>Warming up the participant to the interview situation, and building rapport</p> <p>Starting to build an understanding of their life and/or their business</p> <p>Get an idea upfront of how</p>

<ul style="list-style-type: none"> - How many times have you been flooded there as a result of weather (.e.g. not burst pipes)? - When was the last time? 	<p>COVID has impacted their business</p> <p>Confirm flooding dates / frequency but don't get into detail on the floods here</p>
<p>3. Knowledge and attitudes towards flooding (with focus on views before they were flooded)</p>	<p>5 minutes</p>
<p>We'll talk in detail about the floods you've experienced later in the interview, but I'd like to start by asking you to think back to before you had been flooded. I'm interested to hear about your thoughts, if any, on flooding at that time.</p> <ul style="list-style-type: none"> - NOTE HOW LONG AGO THEY WERE FIRST FLOODED. THESE QUESTIONS ARE ABOUT THEIR VIEWS PRIOR TO ANY FLOODING. - How much did you know about flooding and the impact it can have on people, before you were flooded? - Where did you get your information about flooding and flood risk from? <ul style="list-style-type: none"> o E.g. Media, friends/family flooded - Did you know about any help or support for people that are at risk of flooding to make their properties more flood resilient? PROBE FOR DETAILS - Did you know you might be at risk of flooding? - IF YES: <ul style="list-style-type: none"> o What made you realise this? PROBE FULLY o Did anything else change your opinion on how at risk your property / business is? <ul style="list-style-type: none"> ▪ PROBE FOR DETAILS / TIMELINE o How did you feel about being at risk of flooding? - Thinking back to before you were flooded on [CONFIRM DATE OF LAST FLOODING], did you consider doing anything to protect your home / business premises? - IF YES: <ul style="list-style-type: none"> o And did you do anything off the back of this? (before the last flood) <ul style="list-style-type: none"> ▪ Discuss with anyone, search online for information [PROBE FOR FULL DETAILS] - Do you expect there to be more or less flooding in Scotland in the next 20 years? Or about the same level? <ul style="list-style-type: none"> o PROBE FOR REASONS AND WHETHER THEY FEEL CLIMATE CHANGE WILL IMPACT THEM/THEIR PROPERTY - Whose responsibility do you think it is to protect homes and businesses from floods? Why? PROBE FOR DETAILS AND REASONING <ul style="list-style-type: none"> o And to what extent do you think they are currently fulfilling this responsibility? 	<p>Understanding attitudes towards / knowledge levels re: flooding and PFR <i>before</i> they were flooded</p> <p>ISM: Individual attitudes / beliefs about flooding and climate emergency, emotions and agency about being at flood risk, cost and benefits. Social - opinion leaders, network and relationships, meanings, rules & regulations. Material - infrastructure / objects</p> <p>Understand their awareness of the climate emergency and</p>

	<p>whether they feel it could impact them</p> <p>ISM: Individual – emotions, agency. Social - meanings</p> <p>Examine perceptions of who is responsible</p> <p>ISM: Individual – agency, skills. Social - roles and identity</p>
<p>4. The flood, its impact and their immediate reaction</p>	<p>10 mins</p>
<p>I'd now like to ask you about what happened when you were last flooded, if that's okay with you?</p> <p>a. The flood itself</p> <ul style="list-style-type: none"> - Please can you talk me through what actually happened? - ALLOW THEM TO DESCRIBE IN THEIR OWN WORDS, IN OWN TIME - NOTE / PROMPT IF NECESSARY: <ul style="list-style-type: none"> o When it happened o How deep the water was o For how long o How it entered the property o What was damaged o What they were able to do (if anything) to reduce the damage caused o Did they have to leave the property? / How long they were out of their home / business premises - What were the main things on your mind? - How would you describe the emotions you were going through after the flood? - And how did the flood affect your family / your business in the days and weeks after the flood? 	<p>Understand their experience of flooding including severity, their feelings, and the impacts on their lives</p> <p>ISM: Individual - emotions, agency Social – meanings, networks and relationships. Material – objects, times and schedules, infrastructure.</p>
<p>5. The repair / rebuild process</p>	<p>15 mins</p>
<p>I'd like to understand how you were feeling and what actions you took, step by step after the water was gone and you began to repair or rebuild your property.</p> <p>[ASK THOSE THAT HAD TO LEAVE PROPERTY] Please can you talk me through what you did when you were first able to return to the property and the week following that, step by step?</p> <ul style="list-style-type: none"> - And, if you can, what you were thinking and feeling at each step? <ul style="list-style-type: none"> o PROMPT IF NEEDED: did they seek help or support, phone insurance / landlord / builders, speak to neighbours - Can you remember why you took the steps you did at that stage? 	<p>Understand the touchpoints, sources of info in the early days after the flood – and behaviours at this stage.</p>

<p>- NOTE ACTION TAKEN & FACTORS SHAPING DECISIONS AT THIS EARLY STAGE</p> <p>[ASK ALL]</p> <p>The next questions are about the next steps you took and the repairs you were able to do after the flood (so after the first week – up until the repairs were done)</p> <ul style="list-style-type: none"> - IF COVERED ALREADY RECAP – what kind of repairs were needed after the flood? <ul style="list-style-type: none"> o Who was the first person/organisation you spoke to about what repairs were needed? o Were there different repair options you considered/discussed with your loss adjuster/builder/anyone else? If any? - How easy or difficult was it to decide what repairs to do? - Did you feel you were in control of the decision making process or were there other factors involved that felt outwith your control? - When looking at what repairs to make to your property, did you seek help from any other organisations or particular people? <ul style="list-style-type: none"> o Who? And how did you find out about them? - Did you speak to any of the following – insurers, tradespeople, your landlord [IF RELEVANT], friends / family, anyone else? - What advice and support did you receive? - Did anyone you spoke to mention the term ‘build back better’ or similar? - Who or what was most useful in helping you decide what to do? - What sources of information did you trust in relation to advice on repairs? <p>Overall impact of the flood / views on their decisions</p> <ul style="list-style-type: none"> - What has the overall impact of the flood been on you / your family / your business? - Looking back, would you have done anything differently in relation to recovering from the flood? <ul style="list-style-type: none"> o Why / why not? FULLY EXPLORE REASONING 	<p>ISM: Social factors – networks, relationships, experts. Individual factors: skills, emotions, agency</p> <p>Begin to understand decision making process, sources of advice and thoughts on PFR - allowing them to give this info relatively unprompted before exploring in more detail below.</p> <p>ISM: Social factors – networks, relationships, experts, institutions. Individual factors: confidence, skills, costs and benefits. Material – rules and regulations</p> <p>Explore decision making process</p> <p>Understand their own appraisal of</p>
---	--

	their decision making
<p>6. Views on the concept of PFR</p>	20 mins
<p>I'd like to explain a bit more about what kind of measures some people take to reduce flood damage, and then get your thoughts on these. (We might have discussed some of them already but I want to get your views on others)</p> <p>There are two kinds of measures that can be taken to reduce damage to properties during a flood:</p> <ul style="list-style-type: none"> - The first keep water out, or reduce the amount of water that can enter a property, such as: flood gates or self closing air bricks. <p>The second type of measures aim to reduce the damage and disruption caused when water does get in and can reduce the amount of time the property is uninhabitable. This could include: different flooring, raised sockets, or kitchen units made from waterproof materials and raised from the floor</p> <ul style="list-style-type: none"> - Were you aware that there are these two types of measures? - The second type of measure are called resilience measures and they aim to allow water to flow through their properties without major damage - What do you think about the idea of such measures which won't stop the water entering the home but can reduce the damage when it does? NOTE INITIAL REACTION AND ANY CONCERNS <ul style="list-style-type: none"> o What would or did put you off installing resilience measures when repairing your property after flooding? o PROMPT IF NEEDED: wasn't aware there was anything available. didn't think it would happen again, costs, hassle, confusing/lack of advice and support, not aware of PFR measures, aesthetics, put people off when we sell, leaving the property soon, don't see it benefiting them enough o FULLY EXPLORE TO UNDERSTAND RELATIVE IMPORTANCE OF FACTORS / BARRIERS, COSTS VS BENEFITS o Did anyone mention any of these measures when you were making repairs to your property? - What would you say were the top 3 factors that meant you decided against installing things that could reduce flood damage in the future? <ul style="list-style-type: none"> o Is that in order of importance? And what weight would you give to each in you making your decision not to install PFR? EXPLORE THE IMPORTANCE / WEIGHT GIVEN TO EACH FACTOR o Is there anything that might make you consider installing resilience measures when repairing your property after a flood? o In an ideal world, what protective measures would you install (if any), if costs were not a concern? NOTE REASONING - Where would you go to find out more about resilience measures? <p>Recommendations & responsibility</p> <ul style="list-style-type: none"> - Do you think awareness of flood resilience measures is high or low among people in your community who may also be at risk of flooding? - What do you think might encourage more people to make the changes to their property that we have discussed? - At what point(s) in the process would advice on this be most helpful? <ul style="list-style-type: none"> o and from whom? 	<p>ISM: Individual - cost & benefit, Values, Beliefs, Attitudes, Emotion, Agency. Social – norms, tastes, meanings. Material - objects</p> <p>Briefly explore awareness of and views on PLP / resilience measures</p> <p>Understand perceptions of specific PFR measures and their value to participants</p> <p>Explore decision making process and barriers to installing PFR in more detail</p>

<ul style="list-style-type: none"> - Did you feel supported and informed when making decisions about your property? - Whose responsibility is it to make sure properties in flood risk areas are as prepared as they can be for future floods? <ul style="list-style-type: none"> o NOTE THE DEGREE TO WHICH THEY SEE GOVERNMENT/THEIR LOCAL AUTHORITY/OTHER AGENCIES AS RESPONSIBLE VS INDIVIDUALS (VS OTHERS?) 	<p>Understand whether views differ for when it comes to resilience measures, as opposed to keeping water out</p> <p>ISM: Social factor – institutions / government, roles and identity. Material – rules and regulations.</p> <p>Explore attitudes toward the role of Government in relation to PFR</p> <p>Understand what participants feel would help them most (when and how)</p> <p>Gain further understanding of their views on individual vs state responsibility</p>
<p>8. Final thoughts</p>	<p>2 mins</p>
<ul style="list-style-type: none"> - Do you have any final thoughts or recommendations on what would have the biggest impact on encouraging home/business owners to make their properties more resilient to flooding? <p>Thank you very much for sharing your experience and views with me, we really appreciate it.</p> <p>STOP RECORDING & ORGANISE PAYMENT OF INCENTIVE</p>	

Appendix 4: ISM framework

The ISM (Individual, Social, Material) behaviour change framework is a tool for policy makers and other practitioners aiming to influence people's behaviours and bring about social change. It is used by the Scottish Government to inform their behaviour change work in a wide range of policy areas.

Further information is available here: <https://www.gov.scot/publications/influencing-behaviours-technical-guide-ism-tool/>

THE INDIVIDUAL CONTEXT

This includes the factors held by the individual that affect the choices and the behaviours he or she undertakes. These include an individual's values, attitudes and skills, as well as the calculations he/she makes before acting, including personal evaluations of costs and benefits.

- Values, Beliefs, Attitudes: basic elements of individual's motivational system (broad to specific)
- Costs & Benefits: benefits compared against costs calculation
- Emotions: feelings / emotional response
- Agency: self-control and confidence in undertaking behaviour, perseverance
- Skills: things a person needs to know to carry out a behaviour
- Habit: automatic and frequent behaviours / routines that are less deliberative

THE SOCIAL CONTEXT

This includes the factors that exist beyond the individual in the social realm, yet shape his or her behaviours. These influences include understandings that are shared amongst groups, such as social norms and the meanings attached to particular activities, as well as people's networks and relationships, and the institutions that influence how groups of individuals behave.

- Opinion leaders: individuals that have strong influence over others
- Institutions: formal and informal organisations that influence how individuals behave
- Norms: perception of how other people would view behaviour
- Roles and Identity: repertoires of behaviours and attitudes related to a role and identity is sense of who a person is
- Tastes: preferences that signal belonging to social groups
- Meanings: culturally constructed understandings setting a frame for a behaviour
- Networks and relationships: connections between individuals

THE MATERIAL CONTEXT

This includes the factors that are 'out there' in the environment and wider world, which both constrain and shape behaviour. These influences include existing 'hard' infrastructures, technologies and regulations, as well as other 'softer' influences such as time and the schedules of everyday life.

- Rules and regulations: set formally and informally by institutions to shape behaviour
- Technologies: interaction between individuals and technologies
- Infrastructure: hard and soft infrastructure that shape the emphasis of features in the environment
- Objects: presence and use of external items that interact with individuals
- Time & Schedules: how time as a resource gets used / allotted to activities

12 References

- AGHA, S., 2003. The impact of a mass media campaign on personal risk perception, perceived self-efficacy and on other behavioural predictors. *AIDS Care* 15, no. 6: 749– 62. <https://www.psi.org/wp-content/uploads/2003/12/Agha-S.-2003.pdf>
- ALATAS, V., CHANDRASEKBAR, A., MOBIUS, M. and OLKEN, B., 2019. When celebrities speak: a nationwide Twitter experiment promoting vaccination in Indonesia. Working Paper. *National Bureau of Economic Research*, February 2019. <https://www.nber.org/papers/w25589>
- ARTHUR, S., OWUSU, S., WRIGHT, G., 2015. Public attitudes towards flooding and property-level flood protection measures. *Natural Hazards: Vol 77:1963–1978* <https://link.springer.com/article/10.1007/s11069-015-1686-x>
- BECKER ET AL., 2012. A model of household preparedness for earthquakes: how individuals make meaning of earthquake information and how this influences preparedness. *Natural Hazards: 64(1)* <https://link.springer.com/article/10.1007%2Fs11069-012-0238-x>
- BOELEN, L., CRABBEA, A., TEMPELS, B., and MEES, H., 2016. Shifting public-private responsibilities in Flemish flood risk management. Towards a co-evolutionary approach. *Land Use Policy* 57 23-33 <https://www.sciencedirect.com/science/article/abs/pii/S0264837716301636>
- BIHARI, M. AND RYAN, R. 2012 Influence of social capital on community preparedness for wildfires. *Landscape and Urban Planning. 106: 3* <https://www.sciencedirect.com/science/article/abs/pii/S0169204612000989>
- BOTZEN, W.J.W., KUNREUTHER, H., CZAJKOWSKI, J., DE MOEL, H. 2019 Adoption of Individual Flood Damage Mitigation Measures in New York City: An Extension of Protection Motivation Theory. *Risk Analysis: Vol. 39, Issue 10 Pages 2143-2159* <https://onlinelibrary.wiley.com/doi/full/10.1111/risa.13318>
- BUBECK, P. BOTZEN W.J.W., KREIBICH H., AND AERTS J.C.J.H. 2012. Long-term development and effectiveness of private flood mitigation measures: an analysis for the German part of the river Rhine. *Natural Hazards and Earth System Sciences. Vol. 12, 3507–3518* <https://nhess.copernicus.org/articles/12/3507/2012/>
- CHILVERS, J., HARVATT, J., PETTS, J. 2010. Understanding householder responses to natural hazards: Flooding and sea-level rise comparisons. *Journal of Risk Research. Vol. 14 (1): 63-83* <https://www.tandfonline.com/doi/figure/10.1080/13669877.2010.503935?scroll=top&needAccess=true>
- DEPARTMENT OF ENERGY & CLIMATE CHANGE, UK GOVERNMENT. 2013. Energy Companies Obligation (ECO) Customer Journey. Summary of findings of research with households that received ECO-funded installations in September 2013. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/388692/ECO_Customer_Journey_Research_Report_-_FINAL_PUBLISHED.pdf
- DOWDS, G. PHILIP, L., CURRIE, M. 2020. Long-term impacts of flooding following the winter 2015/16 flooding in North East Scotland. *Scotland's Centre of Expertise for Waters (CREW)* <https://www.crew.ac.uk/publication/impacts-flooding-north-east-scotland-comprehensive-report>
- FRIED SJ. AND WINTER G. 2010. Homeowner Perspectives on Fire Hazard, Responsibility, and Management Strategies at the Wildland-Urban Interface. *Society & Natural Resources. Vol 13 (1).* <https://www.tandfonline.com/doi/abs/10.1080/089419200279225>
- GROTHMANN T, REUSSWIG F. 2006. People at risk of flooding: why some residents take precautionary action while others do not. *Nat Hazards* 38:101–120 https://www.academia.edu/10092852/People_at_Risk_of_Flooding_Why_Some_Residents_Take_Precautionary_Action_While_Others_Do_Not
- HANGER, S. LINNERTHOOTH-BAYER, J. SURMINSKI, S. NENCIU-POSNER, C. LORANT, A. IONESCU, R. ANTHONY PATT, A. 2017. Insurance, Public Assistance, and Household Flood Risk Reduction: A Comparative Study of Austria, England, and Romania. *Risk Analysis. Vol. 38 Issue 4: 680-693* <https://onlinelibrary.wiley.com/doi/full/10.1111/risa.12881>

- HOWE, R. 2011 Hurricane preparedness as anticipatory adaptation: a case study of community businesses. *Global Environmental Change Volume. 21, Issue 2: 711-720*
<https://www.sciencedirect.com/science/article/abs/pii/S0959378011000239>
- HUDSON, P., BOTZEN, W.J.W., FEYEN, L. AND AERTS, J.C.J.H., 2016. Incentivising flood risk adaptation through risk based insurance premiums: Trade-offs between affordability and risk reduction. *Ecological Economics: Vol. 125: 1-13*
<https://www.sciencedirect.com/science/article/abs/pii/S0921800916301240>
- JOFFE, H., PEREZ-FUENTES, G., POTTS, H. AND ROSSETTO, T. 2016. How to increase earthquake and home fire preparedness: the fix-it intervention. *Natural Hazards Vol 84, pages1943–1965* <https://link.springer.com/article/10.1007/s11069-016-2528-1>
- KERR, N., AND WINSKEL, M. 2018. Private household investment in home energy retrofit: reviewing the evidence and designing effective public policy. *ClimateXChange*.
<https://www.climatexchange.org.uk/research/projects/private-household-investment-in-home-energy-retrofit-reviewing-the-evidence-and-designing-effective-public-policy/>
- KIEVIK, M. AND GUTTELING J.M. 2011 Yes, we can: motivate Dutch citizens to engage in self-protective behavior with regard to flood risks. *Natural Hazards: Vol 59*
<https://ris.utwente.nl/ws/portalfiles/portal/6593336/Kievik11yes.pdf>
- KOERTH, J., VAFEIDIS, A., HINKEL, J. and STERR, H., 2013. What motivates coastal households to adapt pro-actively to sea-level rise and increasing flood risk? *Regional Environmental Change Vol. 13, no. 4 (August 1, 2013): 897–909*.
https://www.researchgate.net/publication/236986033_What_motivates_coastal_households_to_adapt_pro-actively_to_sea-level_rise_and_increasing_flood_risk
- KUNREUTHER, H., 1996. Mitigating Disaster losses through insurance. *Journal of Risk and Uncertainty: Vol. 12, issue 2–3 171–187* <https://link.springer.com/article/10.1007/BF00055792>
- LAMOND, J.E., PROVERBS, D.G., HAMMOND, N., 2009. Accessibility of flood risk insurance in the UK: confusion, competition and complacency. *Journal of Risk Research. Vol. 12 (6) 825-841*
https://www.researchgate.net/publication/240530090_Accessibility_of_flood_risk_insurance_in_the_UK_Confusion_competition_and_complacency
- LINDELL, M.K. AND HWANG, S.N. (2008) Households' Perceived Personal Risk and Responses in a Multihazard Environment. *Risk Analysis, 28, 539-556*.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1539-6924.2008.01032.x>
- MCIVOR, D. AND PATON, T, 2007. Preparing for natural hazards: normative and attitudinal influences. *Disaster Prevention and Management: Vol. 16 No. 1, pp. 79-88*.
<https://www.emerald.com/insight/content/doi/10.1108/09653560710729839/full/html>
- MICELI, R., SOTGIU, I., SETTANNI, M. 2008. Disaster preparedness and perception of flood risk: A study in an alpine valley in Italy. *Journal of Environmental Psychology. Vol. 28 (2): 164-173*
<https://www.sciencedirect.com/science/article/abs/pii/S0272494407000904>
- NAKAGAWA, Y. 2017. The lived experience of preparing for earthquakes in households: a phenomenological psychological study. *Nat Hazards: Vol. 88: 1825–1844*
<https://link.springer.com/article/10.1007/s11069-017-2948-6>
[jfr3.12176](https://doi.org/10.1007/s11069-017-2948-6)
- OAKLEY, M. 2018. Incentivising household action on flooding: Options for using incentives to increase the take up of flood resilience and resistance measures. *Flood re and The Social Market Foundation* https://www.floodre.co.uk/wp-content/uploads/2018/03/SMF-Incentivising-household-action-on-flooding_web.pdf
- OSBERGHAUS, D. (2017) The effect of flood experience on household mitigation—Evidence from longitudinal and insurance data. *Global Environmental Change: Vol. 43: 126-136*
<https://www.sciencedirect.com/science/article/abs/pii/S0959378016302394>
- O'SULLIVAN, J.J. BRADFORD, R.A., BONAIUTO, M. DE DOMINICIS, S., ROTKO P. AALTONEN J., WAYLEN K., A.LANGAN S., 2012. Enhancing flood resilience through improved risk communications. *Natural hazards and earth system sciences Vol. 12(7):2271-2282*

<https://nhess.copernicus.org/articles/12/2271/2012/#:~:text=Enhancing%20flood%20resilience%20through%20improved%20risk%20communications.%20Abstract.,in%20Finland%2C%20Ireland%2C%20Italy%20and%20Scotland%20is%20presented.>

PARK, T. OAKLEY, M. AND LUPTAKOVA, V., 2020. *Delivering Benefits through evidence: Applying behavioural insights to property flood resilience*. Environment Agency https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913967/Applying_behavioural_insights_to_property_flood_resilience_-_report.pdf

POUSSIN, J.K. WOUTER BOTZEN, W.J. & AERTS, J.C.J.H. 2013. Stimulating flood damage mitigation through insurance: an assessment of the French CatNat system. *Environmental Hazards*: Vol. 12 Issues 3-4 : 258-277 <https://www.tandfonline.com/doi/abs/10.1080/17477891.2013.832650>

POUSSIN, J.K., BOTZEN W.J.W., AERTS, J.C.J.H. 2014. Factors of influence on flood damage mitigation behaviour by households. *Environmental Science and Policy*. Vol. 40: 69-77 <https://www.sciencedirect.com/science/article/abs/pii/S1462901114000264>

REINECK, C., SUERKEMPER F., VONDUNG F., THOMAS S. AND WORLEN C. 2020. The Federal Programme for Heating Systems Optimisation in Germany - evaluation methods and intermediate results. Energy Evaluation Conference, London, 2020. <https://energy-evaluation.org/wp-content/uploads/2020/07/eee2020-paper-reineck-christina-42-161-vondung-florin.pdf>

SURMINSKI, S. AND THIEKEN, A. H. 2017. Promoting flood risk reduction: the role of insurance in Germany and England. *Earth's Future*. ISSN 2328-4277 <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017EF000587>

TERPSTRA, T. (2011) Emotions, trust, and perceived risk: affective and cognitive routes to flood preparedness behaviour. *Risk Analysis* Vol. 31(10): 1658-75 <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1539-6924.2011.01616.x>

THIEKEN, A.H., PETROW, T., KRIEBICH, H., MERZ, B., 2006. Insurability and Mitigation of Flood Losses in Private Households in Germany. *Society of Risk Analysis*. Vol. 26(2):383-95 <https://pubmed.ncbi.nlm.nih.gov/16573628/>

1037

THISTLETHWAITE J., HENSTRA D., BROWN C., SCOTT D. 2018. How flood experience and risk perception influences protective actions and behaviours among Canadian homeowners. *Environmental Management* 61:197–208 https://www.researchgate.net/publication/321760004_How_Flood_Experience_and_Risk_Perception_Influences_Protective_Actions_and_Behaviours_among_Canadian_Homeowners

ZIOLECKI, A., THISTLETHWAITE, J. HENSTRA, D., SCOTT, D. 2020 Canadian Voices on Flood Risk 2020: Findings from a national survey about how we should manage an increasingly costly and common. *Partners for Action* <https://uwaterloo.ca/partners-for-action/current-projects/canadian-voices-flood-risk-2020>

© Published by Ipsos MORI, 2021, on behalf of ClimateXChange. All rights reserved.

While every effort is made to ensure the information in this report is accurate, no legal responsibility is accepted for any errors, omissions or misleading statements. The views expressed represent those of the author(s), and do not necessarily represent those of the host institutions or funders.

climateXchange

Scotland's centre of expertise connecting climate change research and policy

✉ info@climatexchange.org.uk
☎ +44(0)131 651 4783
🐦 @climatexchange_
🌐 www.climatexchange.org.uk

ClimateXChange, Edinburgh Climate Change Institute, High School Yard, Edinburgh EH1 1LZ