**Institution: University of the West of England, Bristol**

**Unit of Assessment: 13**

**Title of case study: Improving flood resilience through better policy, practice and guidance**

**Period when the underpinning research was undertaken:** 2010 - 2020

**Details of staff conducting the underpinning research from the submitting unit:**

| Name(s): | Role(s) (e.g. job title): | Period(s) employed by submitting HEI: |
|---|---|---|
| Jessica Lamond | Professor | 2011 – present |
| David Proverbs | Professor | 2010 – 2014 |
| Lindsey McEwen | Professor | 2011 – present |
| Rotimi Joseph | Associate Lecturer | 2011 – 2017 |
| Namrata Bhattacharya-Mis | Research Fellow | 2014 – 2017 |
| Amanda Wragg | Research Associate | 2014 – 2016 |

**Period when the claimed impact occurred:** 2014 – 2020

**Is this case study continued from a case study submitted in 2014?** No

## 1. Summary of the impact

Flood resilience measures can significantly reduce loss and damage to property due to flooding. Historically, however, uptake of such measures has been low. Research conducted at the University of the West of England (UWE) has identified factors which lead to low uptake of Property Flood Resilience (PFR) measures and provided recommendations to promote their acceptance. This research has influenced UK policy and long-term plans to tackle the effects of flooding as well as the budget to achieve this. It has provided the evidence needed to help convince insurers that they should recognize and reward PFR and help policy holders become more flood resilient by building back better, resulting in changes to practice within the industry. The UK construction industry and global real estate interests have also benefited from better guidance, standards and codes of practice based on UWE thinking. Finally, around 50% of eligible policy holders in the UK have benefitted from better advice to improve their resilience to flooding: more households and businesses are taking up property flood resilience, gaining peace of mind, and suffering less damage and disruption.

## 2. Underpinning research

Property flood resilience (PFR) is a key aspect of integrated flood risk management. With such measures, individual properties are adapted to reduce water ingress (resistance) and steps are taken to limit the damage from flood water to individual properties (recoverability). PFR can reduce loss and damage and is encouraged by policy makers. A 2019 government report, *Long-term investment scenarios*, shows that we could reduce future flood damages in England by 18% if over 200,000 cost effective schemes were put in place, and up to a quarter if PFR was adopted by all residential properties at risk. Uptake has, however, been low historically. New research at UWE led by Professor Jessica Lamond, has identified the underlying factors accounting for low uptake and has identified potential ways in which this can be increased.

Previous research has focused on the societal costs and benefits of adaptation. It has

identified the lack of information available to households and businesses as a barrier to uptake. Vested industry interests have also resulted in the promotion of specific resistance technologies and approaches which have not necessarily been optimal in particular contexts. In collaboration with national and international academic partners, consultants and practitioners, UWE has carried out research for a range of industrial and governmental bodies. This has taken a multi-stakeholder perspective and has revealed the pivotal role of insurance, the wide range of actors that influence uptake, and the complexity of the barriers, enablers and incentives impacting uptake.

Property level adaptation and insurance for post-flood recovery are the responsibility of, and decided by, individuals with the support of commercial insurance companies. UWE research (**G1**) developed a novel cost-benefit appraisal method for property owners and insurers. In 2015, published new findings revealed the benefits of installing resilience, including willingness of households to pay to remove distress and disruption of flooding, and showed PFR to be more cost beneficial than previous estimates (**R1**).

This new research highlighted:

- the benefit of installing PFR measures during the recovery period following a flood (resilient repair);
- the importance of recoverability approaches within PFR;
- and, for the first time, the quantifiable impact of adaptation on the psycho-social impacts of flooding (**R2**).

Subsequent research for the Department for the Environment Food and Rural Affairs (DEFRA) (**G2**) and *Flood Re* (the national flood re-insurance pool formed in 2016) (**G3**) demonstrated a stronger financial case for resilient repair, particularly for some low-cost widely-applicable adaptations such as cement sand and render (**R3**).

Research on the link between behaviour on the one hand and the incentives provided by insurance on the other was also carried out on an international basis for the World Bank between 2010 and 2012 (**G4**), and was further developed for the Dutch *Knowledge for Climate* organization. Findings included the importance of ensuring insurance incentives for households, but also the lack of motivation for direct insurers to act, and the need for private public cooperation (**R4**). Lessons learned from frequently flooded communities and businesses revealed that individuals with flood experience and flood memory employ diverse insurance strategies. Small businesses (in contrast to households) were found to be willing and able to absorb small losses in order to maintain their insurance against more significant future events (**G2**, **R5**).

Understanding of multi-stakeholder perspectives was further developed through research projects for DEFRA (**G2**) and for the Royal Institution of Chartered Surveyors (RICS) in 2015/16 (**G5**). Novel findings included: the pervasiveness of informational barriers extending to industry and professionals; the understanding that capacity building for local networks of suppliers and advisors would be needed to support communities; that peer to peer learning and targeted expert advice were both helpful in encouraging action and expert advice or guidance was essential for appropriate choice and implementation of many measures (**R3**). The lack of appropriate standards and guidance was identified through UWE research as a fundamental barrier to increasing uptake. UWE research (**R6**) has also demonstrated the need for professionals and insurers to be motivated by insurance terms and conditions to engage with capacity building in this area.

## 3. References to the research

**R1** Joseph, R., Proverbs, D. & Lamond, J. 2015. Assessing the value of intangible benefits of property level flood risk adaptation (PLFRA) measures. *Natural Hazards,* 79**,** 1275-1297. https://doi.org/10.1007/s11069-015-1905-5
**R2** Lamond, J. E., Joseph, R. D. & Proverbs, D. G**.** 2015 An exploration of factors affecting the long-term psychological impact and deterioration of mental health in flooded households. *Environmental Research*, 140, 325-344. https://doi.org/10.1016/j.envres.2015.04.008
**R3** Lamond, J., McEwen, L., Twigger-Ross, C., Carly Rose, C., Rotimi, J., Wragg, A., Papadopoulou, L., White, O and Proverbs, D. 2017. Supporting the uptake of low-cost resilience: Final report (FD2682). London: Defra. http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=19221
**R4** Lamond, J. & Penning-Rowsell, E. (2014). The robustness of flood insurance regimes given increased risk resulting from climate change. *Climate Risk Management,* 1 (2) pp. 1-10. https://doi.org/10.1016/j.crm.2014.03.001
**R5** Bhattacharya-Mis, N, Joseph, R., Proverbs, D. & Lamond, J. (2014) An overview of the grass-root preparedness against potential flood risk among residential and commercial property holders. *International Journal of Disaster Resilience in the Built Environment,* 6 (1) pp. 44-56 https://doi.org/10.1108/IJDRBE-08-2014-0059
**R6** Lamond, J., Bhattacharya-Mis, N., Chan, F. K. S., Kreibich, H., Montz, B. E., Proverbs, D. & Wilkinson, S. 2017. Flood risk mitigation and commercial property advice: An international comparison. In: PITMAN, K. (ed.) RICS Research report. London: Royal Institution of Chartered Surveyors. https://uwe-repository.worktribe.com/output/890695

### Evidence of the quality of the supporting research

**G1** Lamond J, *Flood Memory project*, EPSRC, 2012-2016, £145,619
**G2** Lamond J, *Supporting the uptake of low-cost resilience*, DEFRA, 2014-2017, £138,900
**G3** Lamond J, *Evidence Project phases 1 & 2*, Flood Re Ltd, 2016- 2018, £79,723
**G4** Proverbs D, *Global Urban Flood Risk Management Handbook,* World Bank, 2010-12, £9,374
**G5** Lamond J, *An International Evaluation of the Role of Chartered Surveyors in Providing Professional Flood Risk Advice on Commercial Property*, RICS, 2015-2016, £19,995

## 4. Details of the impact

### Government engagement with industry

UWE research has significantly impacted national policy on flood risk management. From 2014 onwards there has been an increased focus in government policy on property level flood resilience (PFR) and a broader definition of the issues. A DEFRA representative confirmed that:

> *'the evidence and approach to property flood resilience put forward by UWE since 2014 has been highly influential. It has contributed to a new understanding of resilience and to the higher priority given to integrated resistant and recoverable approaches'* (**S1**).

In July 2020, the UK government announced a multi-billion-pound investment and policy statement setting out its long-term plan to tackle the effects of flooding. An emphasis on the adoption of PFR drove the government's strategy: '*We need to see an increase in the uptake of property flood resilience to limit the damage and disruption flooding can cause'* (**S2**). Recent emphasis on multi-stakeholder co-operation was also in part a response to UWE findings on insurance barriers and incentives: '*UWE research showed that more work was needed on engaging the industry'* (**S1**). As a result, the industry (supported by DEFRA) is engaged, through a series of task and finish groups, in implementing a PFR action plan, with UWE invited to the

main steering board (**S1**). Partly as a direct result of the UWE/DEFRA action research project, in 2018, the Budget allocated GBP2,900,000 to pilot projects that draw directly on UWE research recommendations (**S1**). The 2020 Budget went further and reserved GBP200,000,000 between 2021 and 2027 for a resilience programme that covers 25 urban, coastal and rural areas, and features PFR (**S2**).

**Changes in insurer practices**

UWE research on insurance (**R4**) and property level cost benefit (**R1**, **R5**) led to an invitation to work with *Flood Re*, the high-profile flood-risk reinsurance scheme involving insurers and government, to inform their approach to encouraging measures in 350,000 properties most at risk. From a neutral position on PFR in 2016, the current position in the 2018 transition plan is highly pro-active and was directly influenced by UWE's recommendations. The underpinning Flood Re report on encouraging uptake states:

> '*Flood Re worked with the University of the West of England in a substantial research programme…Conclusions to date have led Flood Re to the view that PFR measures are beneficial. Flood Re considers that homeowners should be encouraged to put PFR measures in place*' (**S3**).

A 2018 report by the influential Social Market Foundation think-tank on incentives on flood resilience, drew heavily on an understanding of barriers and supporting uptake from UWE research to recommend normalising resilient repair and a multi-organisational approach to building local resilience (**S4**).

The lead of a DEFRA roundtable SME/Insurance task force confirmed that UWE's research is reaching wider within the industry: *'We have used the results of UWE research...to inform insurers about the benefits of resilience during reinstatement'* (**S5**).

Insurers are increasingly accepting of PFR and some have introduced a policy of providing extra funding for resilience:

> '*Providing evidence to insurers that PFR has a role to play and can make a significant difference in the cost of claims is crucial. The UWE research has played a significant role in providing that evidence. This is distinctive because they take a different approach to valuing'* (**S6**).

In its policy statement, the government highlighted the importance of insurers changing their practices by:

> *'encouraging insurers to price their policies to reflect reductions in risk as a result of property flood resilience – for example by enabling discounted premiums to be available to households which have been fitted with flood resilience measures'* (**S2**).

**Industry, government and professional practice**

UWE research is distinct in also recognising the need to inform the construction and restoration industry. Direct briefing of loss adjusters and local authorities in the aftermath of 2015/16 floods helped to support the high uptake of recovery grants. DEFRA used UWE outputs in their guidance documents for the Flood Recovery Framework information sent to local authorities participating in the scheme (**S1**). Scheme participation was nearly 66% (11,000 flooded households took up the grant offer), amounting to nearly GBP44,000,000 in government assistance for these households (**S1**).

Professor Lamond has contributed to the development by Construction Industry Research and Information Association code of practice on PFR measures (**S7**) which has been supported by the Environment Agency and the Scottish Government (**S8**).

An international body of real estate professionals has benefitted from better guidance for advising owners and occupiers of flood-prone buildings. The guidance comes by way of the Royal Institution of Chartered Surveyors' (RICS) environmental guidance note, published in 2018 (**S9**), which uses material from and cites the UWE/RICS research report (**R6**).

UWE research and guidance has also helped loss adjuster professionals enhance the resilience of properties flooded in 2014-2016. The largest UK loss adjuster stated:

> *'in 2014/15: we offered resilient surveys to all our customers that were eligible for the government Repair and Renew grants. We developed an industry-leading tool for our surveyors to use…the cost-benefit methodology for households developed by UWE, was key. In the 2015/16 flooding we refined this even further and briefed our surveyors even more thoroughly using the new Defra guidance that was based on UWE research. We estimate that 50% of domestic policyholders have benefitted from this advice'* (**S5**).

This viewpoint is particularly significant given that uptake of PFR can potentially have highly positive impacts on 5,000,000 UK households living with flood risk, even where direct damage avoided is lower than costs because of the reduction of intangible, and psycho-social impacts (**S1, R1, R2**).

UWE research and knowledge exchange activities have contributed to high profile UK guidance including *Homeowners Guide to Flood Resilience* and the *Business Guide to Flood Resilience* (**S10**). One of the country's foremost advocates for flood-hit communities, and lead author of these two guides, summed up the impact of UWE's research:

> *'UWE's work on PFR has been hugely influential throughout the UK. There's been a big shift in the past decade towards PFR, promoted by the likes of DEFRA and the Environment Agency off the back of UWE thinking. The UK has moved on from hard engineered flood defences to flood risk management and PFR. UWE research has encouraged and brought about this holistic, long term change, towards tackling flooding'* (**S10**).

**5. Sources to corroborate the impact**

**S1** Testimonial from Policy Adviser (Flood and Coastal Erosion Policy), Department for the Environment Food and Rural Affairs (DEFRA)
**S2** HM Government, *Flood and coastal erosion risk management*: policy statement, July 2020 (p.30, 31, 37)
**S3** Flood Re: Incentivising Household Action on Flooding and Options for Using Incentives to Increase the take up of Flood Resilience and Resistance Measures (March 2018) (p.2)
**S4** Social Market Foundation report on flood resilience (March 2018)
**S5** Testimonial from National Technical Manager, Sedgwick International UK
**S6** Testimonial from Managing Director, GJB Consultancy Oxford Ltd
**S7** CIRIA: Code of Practice for Property Flood Resilience (2019)
**S8** Scottish Government, *Living with Flooding*: Action Plan, November 2019
**S9** Environmental Risks and Global Real Estate: RICS guidance note (November 2018)
**S10** Testimonial from MDA, Flood Resilience Consultants