Retrofitting your home in the event of a flood

Devon Community Resilience Forum

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Resilience, adaptation & community engagement

- Looked at property level resilience across the UK and beyond
 - Worked with the EA, insurers, local authorities, National Flood Forum etc.
- Secondment to Manchester Climate Change Agency
- Previously worked on citizen engagement and community development



towards best practice in property level flood protection

Lain White, Angela Connelly, Stephen Garvin, Nagel Lawson and Paul O'Hare look at the use of grouperty level flood protection as a response to flood risk, and at the development of a 'sis-step approach to property flood resilience.



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CLIMATE ADAPTATION AND RESILIENCE FOR MANCHESTER



INCHESTER CLIMATE READY

IN JULY 2019 MANCHESTER JOINED CITIES ACROSS THE WORLD IN DECLARING A CLIMATE EMERGENCY.

Further information Google Scholar profile:

https://scholar.google.com/citations?user =pM1oXyUAAAAJ&hl=en&oi=ao

Google Scholar profile: www.manchesterclimateready.com



NCHESTER MATE CHANGE INCY

> MANCHESTER CLIMATE RISK: A FRAMEWORK FOR UNDERSTANDING HAZARDS & VULNERABILITY REMAX CHARE AMIL 2021



This morning...

- The context to current and future flood risk
 - Climate change, inherited risk, creeping urbanisation
- Social dimensions of flooding & flood risk
- Some practical approaches
- Sources of further information



Plonkers Wine Bar, York http://www.mirror.co.uk/news/uk-news/york-floods-pictures-reveal-devastation-7085787

Our changing climate

Change in number of people at flood risk from present day





Future flood risk (GM)



Figure 3-2: Surface water flood risk across GM (RoFSW 1 in 100 AEP event)



The flooding challenge

- Contemporary urban flood risk driven by the convergence of complex factors
- Climate change (climate variability) and ever more intense urbanisation
- Look at the work of global institutions such as the United Nations and the Intergovernmental Panel on Climate Change (IPCC)

Help to frame the problem as much about **urbanisation**, social vulnerability & human behaviour





Path dependency

- Inherited risk passed from generation to generation...
- We're 'locked' into consequences of past decisions
- An associated risk of maladaptation (post flood reinstatement)



https://theconversation.com/flood-survivors-should-be-given-proper-support-instead-theyre-toldto-get-resilient-126848

many or a second second part - these descents - represent as the

Greater Manchester communities suffering from years of ignoring flood risk, says geography expert



http://www.manchestereveningnews.co.uk/news/greater-manchesternews/flood-risk-manchester-ignored-warning-12210410

"As the climate crisis increases the frequency and severity of flooding, and urbanisation reduces the land's capacity to absorb water, people may be surprised to learn that houses they bought many years ago are now at risk – not because they moved to a floodprone area, but because the flood zone moved to them."

The flooding challenge



Near Whally Arches, Ribble Valley www.clitheroeadvertiser.co.uk/news/slideshow-ribble-valley-flooding-1-7643772

The flooding challenge



Around 21,000 homes were built in the floodplain (defined as Flood Zones 2 or 3) every year (on average) between 2001 and 2014 in England (CCC, 2015

Limits of adaptive capacity?







Beyoliny, Waroastandrive, has been increasing with water as fixed defenses failed (Picture: Matro co.uk)

The lived reality of flood risk

- Circa 1 in 6 properties at flood risk across the UK
- Threat to life, property, and the economy
- But also the social fabric of our communities
 - Disrupts lives & livelihoods for years
 - Secondary impacts e.g. long term (mental) health implications
 - Impacts on children particularly pernicious







You could move house...



'Last house rolls out of Lents floodplain' http://djcoregon.com/news/2010/08/25/last-house-rolls-out-of-lents-floodplain

You could raise your house...



Corbridge, Northumberland Paul O'Hare

BBC news article: http://www.bbc.co.uk/news/uk-england-tyne-36154258



Wraysbury, Berkshire

Daily Mail:

www.dailymail.co.uk/news/article-2739212/Now-THAT-S-movingworld-After-floods-devastated-house-one-determined-homeownerlifted-building-nearly-5ft-air-furniture-all.html

Amphibious buildings



www.theguardian.com/artanddesign/2011/may/01/brockholes-preston-review-rowan-moore

Property level resilience

- Dry-proofing keeping water out of a building
- Wet proofing allowing a building io flood, but doing so in a controlled, managed way, and/ or ensuring recovery and reinstatement can occur as easily as possible

Mary Dhonau, CEO of Mary Dhonau Associates & Chair of Flood Protection Group at Property Care Association

@floodmary







Design for demonstration of flood resilient repair





Resistance





Floor/ Cavity drain membrane and sump pump

- Original concrete floor
- Profiled drainage membrane
- Resilient insulation boards
- Screed membrane
- 50 mm self levelling concrete screed
- Ceramic tile finish, turned up walls by 150 mm, fully bedded in waterproof adhesive







Walls

- Resistance and resilience
- Resistance: Cavity drainage membrane, drain and pump: groundwater and external water under force
- Resilience: membrane prevents wetting of wall, resilient insulation and wall board finish; drying of cavity via ventilation or limited removal / replacement of boards and insulation





Walls 2

- Resilient
- PUR (100 mm thick) insulation, with resilient wall board finish
- Cement render, directly onto brickwork (party wall) and blockwork (internal partition)





Resilient kitchen

- No MDF or chipboard components; or laminated or melamine surfaces
- Resilient composite material
- Ceramic work tops
- Tiled under units





Services

- Electrical: wiring hung from ceiling down walls
- Sockets located above flood level (800 mm, 1200 mm, 1500 mm)
- Water: non-return valves on toilets, kitchen supply / drainage





The BRE flood house



Image courtesy of Dr Stephen Garvin/ Building Research Establishment <u>www.bre.co.uk/flo</u> <u>odhouse</u>

BBC Countryfile



BBC Countryfile 19th February, 2017

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Putting PLR in its place

- You need to get the right approach, right product, right place, right context
 - Finding the correct product(s)/ solutions for the circumstances
 - Holistic assessment of vulnerability social & technical
- Consider product 'life cycle'
 - Sourcing and procurement
 - Use and storage
 - Maintenance and service agreements
- Beware of thresholds, vulnerabilities and possible points of failure
- When PLR is not appropriate & expectation management

The 'six steps'





The 'six steps'





Breaking the 'maladaptation cycle'

- A 'window of opportunity' for PLR but are we taking these?
 - Home-owner autonomy removed
 - Insurers rarely pay for *betterment* –*reinstate* property to original condition
 - Emphasises speed of 'bounce back' rather than protection
 - People reluctant to adapt

Bounce-back to pre-flood normality (equilibrium)



Maladap	otation	Cycle'
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Some constraints to property adaptation

- Fragmented/disjointed governance confusion regarding responsibilities
- Lack of Govt. control e.g. building regulations
- Conflicting priorities of local authorities
- Shift in responsibility to the public but evidence of resistance
 - Resistance to 'living with water'
 - Professionals and citizens speak in different languages
 - Context of disappointment and disempowerment
 - Exposure/ vulnerability/ capacity to respond

Creating 'spongy' places

- Not just about the property...
- Gardens, driveways, rooftops, greenspaces, street trees, rainwater harvesting can all be recruited to the adaptation & mitigation cause
- Making space for water
- Backyard SuDS (sustainable drainage systems)



Sources of further information

The National Flood Forum

https://nationalfloodforum.org.uk

https://nationalfloodforum.org.uk/about-flooding/reducing-yourrisk/property-protection-advisor/

http://bluepages.org.uk/

CIRIA

Code of practice for property flood resilience (C790)

https://www.ciria.org/CIRIA/Resources/Free_publications/CoP_for_PFR_ resource.aspx

North West Flood Hub

https://thefloodhub.co.uk/

Mary Dhonau

https://twitter.com/floodmary www.marydhonau.com www.https://edition.pagesuiteprofessional.co.uk/html5/reader/production/default.aspx?pubname=&e did=659cb024-a5d5-4004-acbf-1d9236228817







The social dimension – climate disadvantage

- Certain places & people are more or less sensitive to the impacts of climate change
- And are **more or less able to adapt** to climate change
- Climate change will exacerbate already existent inequalities and disadvantage
 - Poorer people can't afford to move out of flood affected areas
 - People with less disposable income can't insulate their homes, buy adequate insurance, or cope in heat waves
 - Those with disabilities or in ill-health will suffer the greatest impacts of climate change and have less capacity to respond
 - Etc, etc, etc...



Those most vulnerable to climate change, and least able to respond, have contributed least to the drivers of the changing climate

Questions?

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