

Written evidence submitted by Professor Louise Bracken, Neil Heckels, Professor Karen Johnson, Dr Sim Reaney, Durham University (FLO0087)

1. About us

1.1. Louise Bracken is Professor of Hydrology, Deputy Vice Provost and Director of the Water Hub at Durham University.

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1.2. The Water Hub is a partnership between Durham University, Northumbrian Water and the Environment agency, initially funded through the European Regional Development Fund from 2017-20, the Water Hub brings together policymakers, researchers, local communities and business to develop innovative solutions to challenges of water management. More information can be found at <https://www.thewaterhub.org.uk/>

2. Executive Summary

2.1. The questions posed by this inquiry align with several of Durham University's research interests and partnership activities. We see this as a timely opportunity to challenge the UK government to be more ambitious with its plans for flood management and preparedness in the future. Indeed, our own research here at Durham (Robins et al. 2017) has argued that while historically attention has focused on a plethora of specifically water-related projects, initiatives, plans and regulations, what is really needed is a systemic, long-term view of water resource management.

2.2. While broadly supportive of the current direction of policy and the principles within the EA strategy and Government Policy statement, we see it as critical that the Government take a holistic and sustainable view of water resource management. These ambitions need to be underpinned by practical actions, including using statutory powers where necessary.

3. In summary:

3.1. We believe a cultural and systemic shift in how flooding is perceived, managed and protected against is needed to empower communities to become more resilient over the longer term. Communities themselves need to be at the centre of driving this change.

3.2. Linked to this an equal stake in planning decisions is needed between people and communities, planning authorities, insurers and risk management agencies, to ensure that new developments are fully cognisant of the various interests and risks.

3.3. To avoid placing further pressure in areas that experience both high water scarcity and flood risk, a national approach to considering where new developments are located needs to be linked to key issues of water scarcity and flood risk. The Government's levelling up agenda should also incorporate decisions about where to support new investment, for example where new water intensive businesses are located.

- 3.4. Urgent flood response through coordination between the EA and first responders are broadly effective, but a shift is needed from a reactive approach to helping communities to building preparedness at scale on the assumption that major flood incidences are likely to occur, rather than unexpected events.
- 3.5. Legislation could be strengthened to improve flood resilience and water drainage measures, for example through extending the home energy efficiency rating to include 'water performance' measures and making the inclusion of sustainable drainage systems mandatory in all new developments.

In response to the specific questions posed in the inquiry:

4. How effectively do the new Government policy statement and Environment Agency strategy meet the challenge posed by a changing climate?

- 4.1. The direction of travel is positive across both the Government Policy statement and the EA strategy. The UK Government clearly understands that a more holistic approach to flood management and mitigation that shifts the emphasis from hard infrastructure to nature-based solutions and greater involvement of people and communities is needed, particularly as historically infrequent or 'once in a generation' events become more commonplace. However, as with any strategy or written commitment, whether these intentions effectively meet the challenge will depend on how they are operationalised, how government incentivises the relevant actors to work together and whether it is prepared to go far enough in enacting relevant legislation to effect the desired change.
5. In relation to the ***EA flood and coastal erosion strategy*** there are two main aspects we suggest could be strengthened:

- **Involvement of local communities in local decision making:** while the commitments to engaging communities are positive, as the strategy acknowledges, the degree to which this currently happens is inconsistent. There is a risk that without sufficient measures or accountability placed on risk authorities to demonstrate effective engagement, in some areas this could remain tokenistic or peripheral. We recommend strengthening the requirements on risk authorities to demonstrate the extent to which local communities are involved in local decision making. This should go beyond planning for flood events, encompassing a broad range of water management issues, including in local planning decisions for new developments.
- **Building capacity and resilience within communities, particularly to deal with the aftermath of flood incidences:** We suggest that an approach that emphasises working with communities to develop resilience over the long term is key, with the underpinning assumption that flood incidences are expected and the norm. The emphasis on empowerment of communities working on an equal basis alongside all other key stakeholders should be more central to the overall strategy, particularly with a view to reducing the environmental, physical and mental health impacts in the aftermath of a flood incident. Specifically, strategic objective 3.2 could go beyond provision of information to outline an ambitious vision for co-production and community engagement. Likewise, it is essential to incorporate an assessment of this engagement and participation, which will challenge risk planning authorities to demonstrate their commitment in this area.

It would be helpful to see specific expectations in relation to these included within the 2021 Action Plan.

6. In relation to the ***Flood and coastal erosion risk management policy statement*** we similarly welcome the commitment to building community resilience particularly in terms of recovery, but again argue that building this capacity and empowering at-risk communities over the long term should be a more central tenet of the approach. For example, policy commitments in relation to support for the voluntary sector, business and local public services, are vague in comparison to other elements.

Understandably both documents focus on what is needed in terms of local planning, decision making and response. What we feel is missing in both are questions of national significance and addressing fundamental issues about where we want to build and grow in the future. Demand for housing at UK level needs to be balanced with decisions relating to capacity and investment potential. Water management should be seen in relation to broader initiatives, including the levelling up agenda. While particular pressure exists on housing demand in the South East, we should think carefully about locating new housing stock in areas that are both prone to flooding and at risk of water scarcity. These decisions need to be balanced with considerations about economic growth, rebalancing the economy and environmental impact. For example, businesses with high water consumption should be encouraged to locate in areas of the North where there is less pressure on water supply as well as a need for investment and growth.

7. **Are the current national and local governance and co-ordination arrangements for floods and coastal risk management in England effective?**

- 7.1. In terms of immediate response to flood incidents, coordination between the Environment Agency and first responders is generally very good. However, how the longer-term recovery is planned for and managed is currently much weaker. Working with communities to prepare more effectively to build the ability to recover quickly is where we suggest much greater focus is needed. Learning to live with floods is key.

- 7.2. It is also important that we develop greater integration between managing water quality and flooding through catchment management, currently often treated as separate strands of work. A more integrated management structure would enable multiple benefits and greater financial efficiency in catchment interventions to benefit both water quality and flood mitigation.

8. **What level of investment will be required in future in order to effectively manage flood risk in England, and how can this best be targeted?**

- 8.1. It is not always the case that new money is needed. Creative reallocation of resources and devolving more decisions locally could make a significant difference. The Borderlands flood management programme in the NE is an example of where restrictive and overly centralised procurement practices limited the number of actors that could be engaged in delivering flood mitigation. An opportunity was missed to engage local landowners and create a diverse set of devolved interventions. Rethinking internal processes to the EA around procurement and the use of supply chains has the potential to deliver some gain in efficiency of financial resources.

9. **How can communities most effectively be involved, and supported, in the policies and decisions that affect them?**

- 9.1. Research from Durham University (Robins et al. 2017) suggests that ‘there are community-based networks at different scales with a wealth of local knowledge and enthusiasm for improving aspects of water resource management that are proving more stable and resilient than government structures, and could be much better targeted and supported to act as genuine lynchpin actors in the UK’s water governance system.’ With this in mind, it is helpful to see an increased emphasis on engagement with communities in flood management processes and decision making. However as above, we argue that Government needs to be bolder in its commitments to empowering communities.
- 9.2. Our research (Rollason et al. 2018) also suggests that as flood management has evolved, with a greater responsibility now placed on at-risk communities to understand their risk and take protective action to develop flood resilience, communicating flood risk has become an increasingly central part of developing flood resilience. However, current risk communications have not resulted in the intended increase in awareness, or behavioural change. Current risk communications fail to meet user needs for information in the period before a flood event, leaving users unsure of what will happen, or how best to respond. The research showed that participants want information on when and how a flood may occur (flood dynamics), so that they can understand their risk and feel in control of their decisions on how to respond.
- 9.3. The Water Hub demonstrated how engaging the community in sustainable urban drainage (SuDS) initiatives could increase the uptake of solutions, improve maintenance of interventions and exchange knowledge with communities to inform and increase their understanding of environmental challenges (Bracken et al. 2020).
- 9.4. Durham is seeking to lead the way in academic/practitioner collaboration in this area – the After Disasters Network. The After Disasters Network is aimed at exploring challenges of dealing with the aftermath of a disaster and sharing learning about how to support communities at such time. We are interested in the foundations that support psychological, social, institutional, and economic ‘recovering’. We want to learn how to support and manage aftermaths without creating conditions that foster post-disaster crises. The timeframe of the aftermath can be long, with many people ‘living with’ disaster and post-disaster conditions for an extended period.

10. With increasing focus on natural flood management measures, how should future agricultural and environmental policies be focussed and integrated with the Government's wider approach to flood risk?

- 10.1. Durham University research from Bracken et al. (2016), found that there was an overwhelming desire from professional flood managers and local communities for an alternative to simply structural methods of flood management. People were keen to make use of the ability of catchments to store water, even if land needed to be sacrificed to do so.
- 10.2. Research at Durham has considered both the effectiveness of catchment scale approaches to flood risk management and on mapping the potential sources of flood water. This mapping identifies where working with natural processes interventions would be most effective at reduced flood hazards to communities at risk and where developments could create increases in the flood risk (Reaney and Pearson 2016). This mapping work builds upon the SCIMAP water quality management toolset (Reaney et al 2011) that identifies the most effective locations in the landscape for diffuse pollution mitigation measures to be located. Current work is integrating these

methods for spatial targeting to enable a holistic approach to the management of flood risk, water quality (sediments, nutrients and FIOs) and biodiversity. The integrated assessments, which work effectively with the new ELMS approach, enable the identification of locations where one mitigation measure can have multiple benefits, hence achieving flood hazard reductions and water quality and biodiversity improvements at lower cost and impact on farm business.

10.3. In relation to soil health, communities can and should play a big role in returning carbon to the land to improve both local flood resilience and carbon storage. Opportunities for community input and engagement around climate change, net zero and soil health need to be explored. There is a need and an opportunity to prioritise coordinated schemes between local authorities, food and water industries and communities for community composting - where high quality organic matter could be produced and returned in a stable form to soils to maintain and improve carbon storage as well as improve flood resilience. By 2025, all UK local authorities will be required to collect food waste separately from municipal waste and there is an opportunity to support local communities to undertake community composting which is particularly valuable in urban settings. Otherwise we are looking at significant transport miles and processing cycles for local authority run schemes.

10.4. However, Local authorities are concerned about the potential reversibility of carbon storage in land. We need to understand and collate information on **innovative methods to return organic wastes to land to achieve both flood resilience and net zero**. From 2025, local authorities will all have to implement food waste collections. We need to understand how best to process this food waste to optimise soil health. At the moment there is no guidance on how to return organic matter in a stabilised form onto land. However, there is clear academic research showing that organic matter binds strongly to mineral surfaces (eg Tipping et al, 2019). Return of biosolids from the Water Industry (often anaerobically digested) to land has become a controversial topic in its own right after the recent Greenpeace FOI of the AECOM report to the Environment Agency. It is controversial because of the presence of persistent organic pollutants (like antimicrobial resistance genes) in the biosolids. With the correct guidance from Government, engineers and scientists working with social scientists have the skills to consider all the issues - biological, chemical, physical and social - in order to safely return stabilised carbon to the land and increase flood resilience.

11. How can housing and other development be made more resilient to flooding, and what role can be played by measures such as insurance, sustainable drainage and planning policy?

11.1. Planning policy presents a significant opportunity to change things. It is positive to see the changes to the National Planning Policy Framework to place a requirement on all new developments to consider Sustainable Drainage Systems, however rather than this being 'as appropriate' we would suggest this needs to be the default requirement. As well as helping manage water flow and volume, SuDS can also deliver wider environmental benefits, community well-being and economic growth. We suggest that Sustainable Drainage Systems for all new development in England should be made mandatory under Section 3 of the Flood and Water Management Act.

11.2. It is likely that due to pressure on housing, there will continue to be new developments on the floodplain, therefore property flood resilience, measures must be an essential component of any new development in the future. However, most

properties at risk of flooding will be existing housing stock, so efforts to retrofit flood resilience features must be stepped up. A forthcoming Durham University sponsored report, by think tank Policy Connect titled 'Bricks and Water 2', recommends that:

- Part C of Building Regulations should be updated to require all properties at risk of flooding to include property flood resilience measures. These measures should be specified and installed in accordance with the industry Code of Practice for property flood resilience
- Property flood resilience measures for residential buildings come in a wide range of forms, and many will be only appropriate for properties of a certain age, type, or construction. Resilience measures work best when installed as a package and are most cost-effective when completed alongside home improvement work or during restoration following a flood.
- Resilience measures are most effectively implemented as part of a wider flooding strategy for a building, whereby residents should sign up for flood warnings and alerts provided by the Environment Agency and develop a Flood Plan. This allows time for active measures, such as gates and doors to be deployed, valuables to be relocated to upper floors, and vehicles to be moved to higher ground.
- Government should include performance targets for water efficiency, property flood resilience, and sustainable surface water disposal in the forthcoming Future Homes Standard. The scope of the Future Homes Standard should be defined now and legislated ahead of 2025, to give advance market certainty.

11.3. We believe a more integrated planning approach across utilities, planners, businesses and communities is needed. Currently there is too much of a disconnect between developers putting in a planning application and a decision being made separately. We need to get the right people together from the start. Water utilities need to be involved in the decision process too as we shouldn't be locating housing in water scarce areas. We need to explore new business models that provide incentives for all parties.

12. What lessons can be learned from the recent winter floods about the way Government and local authorities respond to flooding events?

- We shouldn't be surprised that the floods happened. Rather we need to expect them to happen as a regular occurrence.
- We need to get better at emergency planning and sharing best practice across flood events.
- There is a huge opportunity to drastically improve our efforts on recovery, to be quicker, reduce recovery periods and limit impacts on the health and economic impacts.
- We need better integration with public health. Good that there is reference in the EA strategy
- We know which areas are going to flood, so why put people at unnecessary risk. We are still building in areas of significant flood risk.

12.1. The greater challenge is possibly educating governments and the media, to challenge their growing expectation that homes and business can be protected from flooding without sustaining catchments in a holistic manner.

13. References

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