ICE submission to the Environmental Audit Committee on flood resilience in England

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About the ICE

The Institution of Civil Engineers (ICE) is a 97,000-strong global membership organisation with over 200 years of history.

It is a centre of engineering excellence, qualifying engineers and helping them maintain lifelong competence, assuring society that the infrastructure they create is safe, dependable and well designed.

Its network of experts offers trusted, impartial advice to politicians and decision makers on how to build and adapt infrastructure to create a more sustainable world.

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Submission

1. **To what extent are current flood resilience assets and interventions fit-for-purpose and what are the strengths and weaknesses?**

Ageing flood defences represent the greatest weakness. Firstly, assets designed and built before our current understanding of climate change did not account for the events we are now experiencing. Secondly, the historic lack of funding and resources for asset maintenance means they now require significant investment.

Asset owners are increasingly reliant on visual inspection as a measure of their condition, which is not dependable for understanding the performance of an asset in flood event conditions or during exceedance. Current funding rules do not easily support asset refurbishment or replacement in many areas of the country, particularly in rural areas, however, these assets provide a critical function to the safety of communities and the protection of the nation's infrastructure.

The government has, and still is, investing in flood defence, however, it is challenging for many schemes to have a fundable business case under the current funding rules. This leads to inefficiency in delivery and uncertainty for the communities involved. Current funding mechanisms do not easily allow for more adaptable flood schemes to be developed, such as delivering a suite of measures over time. This means that communities get the immediate benefit of a smaller scheme, and then the scheme design can be increased and modified over time to manage future risk.

The strengths of current flood resilience assets are the clear ownership and operations procedures.

Planning policy dictates that new development should be geared towards the lowest areas of flood risk and, where that is not possible, suitable resilience measures need to be considered. However, Lead Local Flood Authorities (LLFAs) and the Environment Agency can be stretched for resources which means a reliance on standing advice. Although a single development may be "flood resilient" it is still resulting in an overall increase in risk to the region. Homeowners and communities also need support to become resilient, both as individuals and as communities including improved information on risk, support in place to build community cohesion, and improvements in flood warnings.

- *Are there alternative approaches from across the UK and elsewhere which could help inform improvements and innovation?*

Outside the UK, the organisational structure for water management is very different. Where there is a single organisation owning public land and all types of water management, there is more joined-up planning and water management systems, and greater use of nature-based solutions (NBS). Examples here are Copenhagen and Singapore. Cities such as Bangkok have monitors on their roads to know when the roads are flooded and can respond with their pluvial flood warning system.

2. **How appropriate is the current balance between 'green' nature-based solutions and 'grey' hard infrastructure resilience assets, and what adjustments, if any, are needed to improve it?**

Most professionals wish to use NBS where possible, but the standards and funding requirements depend on a) an accurate estimate of the standard of protection and b) often require a high level of protection.

When considering the urban environment, the water company-managed sewer system is designed to a lower standard of protection and for road, roof and curtilage runoff only, whereas other runoff and higher standards of protection fall to other drainage systems and organisations to manage.

A change in this divide would support the development of NBS, particularly the tricky issue of who maintains it long-term, though it would require a change in legislation. In addition, more devolved powers for local control on funding would allow decisions to be made by flood officers who understand what the best solution for their catchment and the community will be.

More broadly, both grey and green infrastructure are needed. To enable this, funding rules must be improved to support the development of both options as well as the hybrid schemes that must become more commonplace. With the nation's locked-in infrastructure and existing building stock, grey infrastructure will be critical to protecting communities now and in the future, but this needs to be balanced with upstream flow management, attenuation of runoff and greening urban spaces.

- *What role can natural flood management techniques, such as wetland restoration and tree planting, play in enhancing flood resilience while contributing to broader biodiversity and climate objectives?*

How land is managed in catchments is necessary to help address issues such as poor soil health, water quality issues and flood management. Considering the value to flood benefit alone and driving land changes for that purpose may be unhelpful, however, considering the catchment as a system and accounting for all the outcomes (ones that go beyond flood protection or monetised benefits, such as air quality and urban cooling) will provide a more robust business case. Currently, the above challenges are too often funded and managed in silos. Newer approaches such as catchment management in the Wye and Fens and Integrated Water Management Strategies being developed by the Greater London Authority are good practice ways to address this.

3. **What changes to the planning system and building regulations are needed to ensure that buildings and infrastructure are resilient to flooding in the short, medium, and long term?**

The recent changes in the National Planning Policy Framework (NPPF) on spatial planning are positive, including enhancing requirements to cooperate across local planning authority (LPA) boundaries, sustainable drainage systems (SuDS) and considering all sources of flooding.

However, the government must implement Schedule 3 of the Flood and Water Management Act 2010. This is something the ICE and many other experts have been supporting for some time. Surface water flooding is a long-neglected area, but for the country's urban centres, this is only going to get worse without Schedule 3 being implemented.

- *What long-term land use strategies and approaches to flooding should the government consider, especially for communities that cannot be protected from flooding or inundation?*

Increased support and awareness of property resilience are required. Too often the focus is on 'keeping the water out', not being ready to 'bounce back' when the water comes in. In some locations, a more radical approach may be required, such as the Netherlands' Room for the River programme.

To that end, places need to be designed to be able to flood with less financial and emotional impact, and be able to recover quickly from flooding events. The FloodRe 'build back better scheme' funding more resilient construction methods when repairing after a flood should be embedded in the insurance industry. FloodRe is only running until 2039, which raises concerns that people will not be able to be insured beyond then.

While places should be designed and adapted to keep flooding in streets and green spaces, water on roads can be unsafe. Highways engineers and other professionals will need to be brought into the debate to determine which approaches are acceptable, including above-ground flow routes to manage runoff.

There is also an onus on the professions to embed basic flood-resilient design in all engineers and not leave responsibility solely to flood specialists. If all involved in developing infrastructure considered what would happen if a design was inundated with extreme rain, then changes to the design could be made to allow safer runoff.

4. **To what extent are current metrics for monitoring the effectiveness of flood resilience fit for purpose, and what improvements could make them more effective?**

Organisations who have been managing flooding for a while have a good handle on the effectiveness of their solutions and drive continuous improvement, and often if there is a significant event there is a review to understand if the system worked as it should. However, more could be done to pool information between organisations to gain a nationwide understanding of their effectiveness in the face of more extreme events brought about by climate change, and to improve decision-making on flood resilience investment.

5. **How effectively and how frequently do flood risk management authorities work together to tackle flooding issues and do they have sufficient resources and skills available to carry out their work?**

There is strong knowledge within the individual organisations – Environment Agency, local authorities, water companies etc. – but they often lack the capacity and time to come together to think strategically about flood risk. However, there are good examples of co-delivery of flood risk solutions and ICE would encourage the committee to explore how this good practice can be achieved more consistently.

There are a number of 'accidental' flood assets such as rail and highway embankments, but the organisations responsible for these assets are not duty holders under the Flood and Water Management Act (2010).

6. **What should the key priorities be for the Flood Resilience Taskforce, and how can it enhance coordination and improve flood resilience?**

The Taskforce should prioritise community resilience, the cross-government Making Space for Water programme, infrastructure resilience, and rural land use and farming. Flooding models must be developed which account for different community needs, opportunities and constraints. They need to reflect the nature of flooding, and fully value the assets it will be and/or is protecting.

To facilitate some of this, UK-wide data sharing agreements will be required. Regional surface water management strategies such as those occurring in London are to be supported.

- *Is there a role for community-based flood response teams, and who is responsible for building that resource?*

Yes, those who have been affected by flooding become very informed and able to mobilise the local community to help themselves. Organisations such as the National Flood Forum are well placed to do this; more funding for them is the best way forward.

7. **Is there a backlog in maintenance of existing flooding adaptation/resilience assets and in identifying where new ones could be introduced?**

This is a critical issue, as mentioned in our response to question 1. Assets are visually deteriorating, but the data does not go deep enough to understand how they will perform in a flood event. The situation could be much worse than the data suggests.

Skilled engineers left the sector during budgetary cuts in 2011, which meant the sharp increase in flood defence funding in 2014 led to delivery difficulties due to skills shortages (funding then dipped again the following year). If flood authorities had more certainty in long-term flood funding and the ability to carry over funding from one year to the next it would help manage these issues.

- *Is there clarity about whose responsibilities these are, and how could this be improved?*

Sometimes the optimal solution is not pursued because the organisation with the responsibility to maintain an asset does not have the funds to do so, or the certainty that the long-term maintenance will not become a burden.

- *How strong is the knowledge base on both the condition of existing assets and where new ones might be needed and what steps could strengthen it?*

The greatest weakness is that local authorities do not have the resources to generate and maintain an asset management database and implement asset management plans. They require funding settlements that cross multiple years to provide certainty and consistency. In addition, local authorities seriously struggle to attract the skilled people they require; the simple reason being that public sector pay is significantly lower than what can be offered by private consultancies. It is a false economy not to invest in resilience.

8. **What level of flood resilience is required to address the flood risks identified in the Climate Change Risk Assessment and is current funding adequate to meet these risks effectively?**

At a broader level, it is necessary to compare and benchmark to what we, as a nation and as communities, would like our 'level' of resilience to be. The government should accept the advice and recommendations of the National Infrastructure Commission on resilience standards in this space.

This then allows prioritisation by need. Need must be based on the level of impact and not just economic damage. As an example, if flood damage is calculated as a proportion of household income, it will capture the fact those on lower incomes would have endured a greater impact from a flood event than those on a higher income.

CCRA3 identified flooding as a key climate risk including soil health, and economic and social infrastructure, and the government has committed to significant investment in flood risk management. This must be in both mitigation and adaption and be intelligently applied to improve overall resilience of an area or asset – it is going to be increasingly hard to have a one-size-fits-all model.

CCRA has a number of scenarios, including a 'current level of adaptation' which assumes that the nation's defences work largely as before, however, for this to work there needs to be maintenance investment into these defences at a scale not seen in the recent past.

- *Is there sufficient government support and funding for the maintenance of privately-owned flood defence and resilience assets?*

There are questions to be asked as to why the public sector should fund the maintenance of privately owned flood defences. The owners of these assets often may not realise their duties or have the funding and skills to undertake them. There is value in educating owners on their flood defences and how they are maintained and in ensuring that information is handed on when land is sold.

- *What changes, if any, should be made to the next iteration of the Flood and Coastal Erosion Risk Management (FCERM) investment programme to improve its outcomes?*

The remit of the programme should be widened to cover all flood risk authorities.

- *How well does the National Adaptation Plan address the need for flooding adaptation measures, and what additional steps should be taken to ensure effective long-term flood resilience in high-risk areas?*

NAP3 largely restates announcements already made elsewhere, including in the Environment Act, Plan for Water, and Resilience Framework. Nor is there a firm commitment to make climate reporting mandatory for all infrastructure owners and operators, something that the ICE has called for.

Adaptation is still not well understood or given due priority by policymakers. Climate change is not an uncertain, far-off threat; its effects are already being felt. The Climate Change Committee has warned of a "lost decade" in action on adaptation and if NAP3 falls short, the UK could lose another five years to ineffective adaptation action. This would be hugely damaging to the country's infrastructure and the people and businesses that depend on it.

The ICE is developing guidance in this area through an Adaptation Publicly Available Specification (PAS). However, there is some uncertainty as to whether sufficient funding will be available for adaptation, making authorities nervous about adopting new approaches.

9. How can the Government encourage more long-term private investment in flooding defences and resilience measures?

The government needs to make significant advancements to encourage long-term private investment in flood resilience. At the moment this is largely leveraged on a scheme-by-scheme basis, which is inefficient and ineffective. 'Resilience'

currently does not have a market value. Without an understanding of how regulators should measure and reward it, it is hard to incentivise private investment in resilience.

Currently, there would need to be a site that would economically benefit from flood reduction to form a business case for investment. Where the beneficiaries are different owners, it is difficult to build a business case that results in a return on the investment for the investor. Engagement with the insurance industry should be pursued as they are most likely to benefit from investment in flood reduction.

Some flood schemes will have wider benefits outside of the immediate vicinity and there is no effective market to enable investment into this. Learnings should be gleaned from other green markets to develop a sustainable funding offer, ensuring that these new assets are funded appropriately and well maintained to ensure ongoing benefit.

10. What support do property owners and neighbourhoods require to enhance their resilience to flooding?

Engagement with those who are at risk but have never experienced flooding is difficult. Acceptance that there will always be a flood risk and that a property owner could have mitigated the damage often, unfortunately, only happens following an event.

Local authorities, the Environment Agency and water companies do and should continue to have a role in educating and informing the public, improving understanding of how to protect property and react without exacerbating flooding impacts elsewhere. Encouraging behavioural change to enable preparedness and supporting wider community cohesion through funding for flood groups are other solutions.

Home reports could be a mechanism to raise awareness and help people appreciate these risks when buying a home.

A long-term flood insurance mechanism is required, with the ability to 'build back better' – FloodRe is a positive intervention but is time-bound, as mentioned in our response to question 3.