

House of Commons Environment, Food and Rural Affairs Committee Inquiry: Flooding

Written submission of the Institution of Environmental Sciences (IES), May 2020

Summary:

- The IES supports taking a systems approach to addressing flood and coastal risk alongside the wider environmental causes of that risk. For such an approach to be successful, the IES believes that:
- Flood and coastal risk management must be co-ordinated at the catchment-level spatial scale, reflecting interactions across all elements of the water, biosphere, and land environments.
- Arrangements to address flood and coastal risk must not come at the long-term detriment of other environmental goals and should avoid unduly shifting the burden of risk to other aspects of the biosphere which lack the capacity to sustainably manage that risk. Flooding and coastal risk management should not be isolated and should be part of an interdisciplinary approach to reducing flood risk and addressing other environmental crises.
- The Government's aims and priorities should reflect that flood risk is one of a number of interconnected environmental crises, and the Government should take a strategic systems approach to addressing these issues from their causes, rather than prioritising the mitigation of their effects.
- The Government's wider environmental and agricultural policies should embrace a system-wide approach to using techniques such as rewilding, soil and water bioengineering, and source control of water where they are contextually appropriate.
- The Government should take a more active role in promoting the adoption of sustainable drainage systems early in planning processes and infrastructure development.

Background

The Institution of Environmental Sciences (IES) is a membership organisation that represents professionals from fields as diverse as air quality, land contamination, and education, wherever you find environmental work underpinned by science. The organisation leads debate, dissemination and promotion of environmental science and sustainability, and promotes an evidence-based approach to decision and policy making. The Institution stands up for science, scientists, and the natural world.

The IES is submitting evidence as it represents members with expertise in flooding and coastal risk management. Additionally, the organisation's interdisciplinary background gives it a firm appreciation of the interconnected nature of environmental problems and the need to promote systems-based approaches to address them. This approach, as well as the need for sound governance and the transparent use of science in decision-making, is particularly pertinent to the issue of flooding, where solutions and approaches often come under high public scrutiny.

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

- 1.1. Any arrangements for managing flood and coastal risk must reflect the scales that natural processes work at, or they create further risk of issues being shifted

downstream or displaced to other aspects of the biosphere.¹ On this basis, governance and co-ordination arrangements should reflect catchment-level spatial scales. We recognise the importance of the Government's commitment to addressing flood risk on the catchment-level scale in its 25 Year Environmental Plan, however governance and co-ordination arrangements need to be updated to reflect this in practice.²

- 1.2. In particular, catchment-level responses are important to improving resilience in urban areas without putting downstream communities at greater risk of flooding. Taking an approach which is led by a holistic view of the landscape is also likely to produce positive effects for environmental net gain, biodiversity and habitat creation, amenity, resource management, and the ability to address land contamination legacy, achieving multiple benefits from the landscape and helping to realise the Government's other environmental aims. It is important that the Environment Agency's draft National Flood and Coastal Erosion Risk Management Strategy for England recognised these goals, though current governance arrangements do not fully reflect the plans needed to achieve these benefits on a local level.³
- 1.3. As the Environment Agency's own Strategic Environmental Assessment reflected, achieving these benefits will involve the use of natural flood management processes, while the construction of new flood defences and coastal infrastructure may risk negative effects on habitats and species.⁴ For co-ordination of risk management to be effective, it cannot unduly shift the burden of risk onto other aspects of the biosphere or lithosphere, and the precautionary principle must be properly applied. Therefore, governance arrangements must ensure that information and good decision-making tools are locally available to all organisations providing governance around flood and coastal risk to act in ways which do not have negative effects for other environmental targets.
- 1.4. Governance arrangements should also ensure systematic adoption of these approaches across catchment areas, reflecting the interlinking roles of the Environment Agency, Regional Flood and Coastal Committees, Lead Local Flood Authorities, Local Authorities, Internal Drainage Boards, utility companies, highways authorities, local communities, and landowners. In the past, the spread of responsibility across multiple bodies has led to ambiguity in responding to flood risk, which could undermine attempts at co-ordinated catchment-level responses.⁵
- 1.5. Past inquiries by Parliamentary Committees have also reported that co-ordination of flood and coastal risk has historically been too reactive, focusing too heavily on creating resilience for when flooding occurs, rather than recognising the systematic causes of flooding and the ways that flood risk is exacerbated by decisions about land

¹ Committee on Climate Change. (2016). *UK Climate Change Risk Assessment 2017 Synthesis report: priorities for the next five years*. Available at: <https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Synthesis-Report-Committee-on-Climate-Change.pdf>

² DEFRA. (2018). *A Green Future: Our 25 Year Plan to Improve the Environment*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

³ Environment Agency (2019). *Draft National Flood and Coastal Erosion Risk Management Strategy for England*. Available at: https://consult.environment-agency.gov.uk/fcrm/national-strategy-public/user_uploads/fcrm-strategy-draft-final-1-may-v0.13-as-accessible-as-possible.pdf

⁴ Environment Agency. (2019). *Draft National Flood and Coastal Erosion Risk Management Strategy for England: Strategic Environmental Assessment (SEA) - Non Technical Summary of the Amended Environmental Report*. Available at: https://consult.environment-agency.gov.uk/fcrm/national-strategy-public/user_uploads/sea-er-2019-amended-nts-.pdf

⁵ House of Commons Library. (2017). *House of Commons Briefing Paper: Flood risk management and funding*. Number CBP07514. Available at: <http://researchbriefings.files.parliament.uk/documents/CBP-7514/CBP-7514.pdf>

management which are made upstream.^{6,7} Whilst we recognise that the Government's acknowledgement of this is reflected in the 25 Year Environmental Plan, governance arrangements need to be reviewed to proactively address risk before flooding occurs.

1.6. For governance of flood and coastal risk to be effective, it must also be part of a wider strategic approach, reflecting that these risks are “wicked issues” related to a number of other interconnected crises around water quality and scarcity, public health and wellbeing, and biodiversity loss, as well as long-term housing and infrastructure planning arrangements.⁸ It is therefore important that flooding risk management is a factor in other areas of decision-making, and particularly during planning and development processes, as well as in agricultural and land management practices. In particular, the Government should make full use of the potential for Strategic Environmental Assessments to systematically identify and address these interconnected issues.

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

2.1. While the recent floods can rightly be used as a way to identify areas for responses and resilience to be improved, the Government and Local Authorities should also take proactive steps to address the causes of flooding where possible, with recognition of the wider environmental context of climate and land use which can increase the likelihood and intensity of flooding.

2.2. The Committee on Climate Change has reported that, depending on future temperature rises, it may not be possible for all flood damage to be addressed through adaptation and mitigation techniques, which may be insufficient to prevent the full consequences of flooding.⁹ A purely responsive approach to addressing flooding is therefore unlikely to be efficient, and an integrated approach involving environmental land management may be more effective at creating long-term resilience by combining carbon storage with direct mitigation of the intensity of flooding.¹⁰

3. Given the challenge posed by climate change, what should be the Government's aims and priorities in national flood risk policy, and what level of investment will be required in future in order to achieve this?

3.1. The significant challenges posed by flooding are likely to increase due to the effects of climate change. It is important to recognise on a strategic level that both climate change and flood risk are connected to a wider set of environmental issues, and that any approach to solving them will need to account for all aspects of the biosphere, land use, and water management.¹¹ The Government should therefore prioritise a systems

⁶ House of Commons Environment, Food and Rural Affairs Committee. (2016). *Future flood prevention - Second Report of Session 2016–17*. Available at:

<https://publications.parliament.uk/pa/cm201617/cmselect/cmenvfru/115/115.pdf>

⁷ House of Commons Environmental Audit Committee. (2016). *Flooding: Cooperation across Government - Second Report of Session 2016–17*. Available at:

<https://publications.parliament.uk/pa/cm201617/cmselect/cmenvaud/183/183.pdf>

⁸ Chartered Institution of Water and Environmental Management (CIWEM). (2017). *A place for SuDS?* Available at: <https://www.ciwem.org/assets/pdf/Policy/Reports/A%20Place%20for%20SuDS%20Online.pdf>

⁹ Committee on Climate Change. (Reference 1).

¹⁰ Environment Agency. (Reference 4).

¹¹ Chartered Institution of Water and Environmental Management. (Reference 8).

approach to addressing flood risk policy as part of its wider environmental context, and should work actively to avoid displacing risk to other areas of the biosphere.

- 3.2. Climate change may also be having a direct effect on soil erosion, exacerbating the ways that agricultural land use can make soil less permeable and reducing water infiltration into soil. This has consequences for long-term flood defence, with increased run-off leading to greater peak water flows.¹² The Government should aim to address the issue of soil quality directly in its response to flood risk, and investment in bioengineering approaches may be appropriate in some contexts. The Pontbren Project has demonstrated that planting tree belts around agricultural land can affect soil permeability and can also address flood risk directly through the interception of rainfall.¹³ However, any soil and water bioengineering responses to flood risk will need to be context-specific, and should be used as part of a wider natural flood management approach.
- 3.3. The effect of rising sea levels in conjunction with unregulated land use can also lead to 'coastal squeeze', putting more pressure on the use of coastal land, and posing specific challenges for coastal ecosystems such as saltmarsh, mudflat, and sandflat. These intertidal habitats are vital for protecting biodiversity, but also have a significant effect on the future sustainability of coastal risk management. The Government should aim to use the management of flood and coastal risk to address these challenges and safeguard coastal ecosystems.¹⁴ For this to be successful, national flood and coastal risk policy will need to manage local plans as part of a wider coastal strategy.

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

- 4.1. In order for communities to be effectively involved in decision-making around the management of flood and coastal risk, they need to be provided with knowledge of the wider systems which are involved on a catchment-wide spatial scale. The important involvement of affected parties in flood risk management may provide opportunities to build community knowledge of interconnected environmental issues and to engage those communities in wider questions of land use and how it affects them.
- 4.2. In particular, the Government should prioritise the co-production of locally-relevant contextualised knowledge of issues which affect communities and how flood risk management can impact them across the catchment-level spatial scale. This should provide opportunities to enhance governance of decision-making processes, as well as increasing engagement in those processes.
- 4.3. Whilst we recognise the difficulty in securing long-term community engagement, any piecemeal involvement in decision-making on these issues which does not give communities the chance to engage in the wider environmental issues causing and caused by flood risk is unlikely to be effective at securing long-term benefits. In particular, it will be crucial to support communities in developing a system-level understanding of these interconnected issues.

¹² Environment Agency. (Reference 4).

¹³ Woodland Trust. (2013). *The Pontbren Project: A farmer-led approach to sustainable land management in the uplands*. Available at: <https://www.woodlandtrust.org.uk/media/4808/pontbren-project-sustainable-uplands-management.pdf>

¹⁴ Parliamentary Office of Science and Technology. (2009). *Postnote: Coastal Management*. Number PN-342. Available at: <http://researchbriefings.files.parliament.uk/documents/POST-PN-342/POST-PN-342.pdf>

5. 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?

- 5.1. Natural Flood Management (NFM) measures¹⁵ will be crucial to addressing flood risk while delivering the Government's other environmental commitments. Given the interconnected nature of many environmental issues and their impacts on flooding, it will be important to use a wide range of NFM techniques, and to integrate these measures in a number of policy areas, including around management of agricultural practices, the Government's systematic approach to the use of land and rivers, planning, and infrastructure development.
- 5.2. Agricultural policies should be adapted to integrate a catchment-level approach to managing flood risk. This will require a wider adoption of NFM techniques across agriculture, and more consistent recognition of the value of land use. The Agriculture Bill's approach to rewarding 'public money for public goods' provides an avenue to increase adoption of these techniques where they prevent, reduce, or protect from environmental hazards such as flooding.¹⁶ However, as this is currently only a permissive option, rather than a regulatory stance on land management, the Government will need to take further action alongside it to promote widespread changes to agricultural practices and to improve how land management affects soil health and water retention on agricultural land.
- 5.3. Rewilding can also be an appropriate technique for NFM in certain contexts, and the Government's strategic approach to agriculture and land use should reflect this. Rewilding has direct effects on soil quality and the slowing of water flows, addressing many of the consequences of historic land use which has reduced soil permeability and infiltration, leading to a long-term increase in run-off. By returning to more natural processes of land management, rewilding can reverse this process, as well as having important benefits for biodiversity and carbon storage.¹⁷
- 5.4. Specifically, diverse ecosystems such as riparian woodland, peatland, wetlands, mires and bogs can all have positive effects for reducing flood risk. Increased soil permeability leads to greater infiltration which reduces downstream peak flows, while large woody debris slows flows directly and vegetation intercepts rainfall, allowing for evapotranspiration processes to occur. These ecosystems also have benefits for biodiversity, carbon storage, and soil and water quality.¹⁸ It is important that the 25 Year Environmental Plan recognises the benefits that many of these ecosystems can have for the management of flood risk, but this recognition must be translated into practical consequences for Government decisions about the use of land in order for these ecosystems to be properly protected and cultivated.
- 5.5. Similarly, taking a natural capital approach which identifies rivers as complex and dynamic systems would allow for better management of flood risk. Currently, reliance on sewerage and culverts in some contexts may lead to increased water flows and may exacerbate flood risk in some scenarios. Given the likely increase in pressure on

¹⁵ Wingfield, T., Macdonald, N., Peters, K., Spees, J., Potter, K. (2019). *Natural Flood Management: Beyond the evidence debate*. Area. 2019; 51:743–751. Available at: <https://doi.org/10.1111/area.12535>

¹⁶ House of Commons Library. (2020). *House of Commons Briefing Paper: The Agriculture Bill 2019-20*. CBP8702. Available at: <http://researchbriefings.files.parliament.uk/documents/CBP-8702/CBP-8702.pdf>

¹⁷ Parliamentary Office of Science and Technology. (2016). *Postnote: Rewilding and Ecosystem Services*. Number PN-537. Available at: <http://researchbriefings.files.parliament.uk/documents/POST-PN-0537/POST-PN-0537.pdf>

¹⁸ Parliamentary Office of Science and Technology. (2011). *Postnote: Natural Flood Management*. Number PN-396. Available at: <http://researchbriefings.files.parliament.uk/documents/POST-PN-396/POST-PN-396.pdf>

sewerage due to projected increases in rainfall, these issues are likely to increase over time.¹⁹ The use of natural water retention measures and river re-meandering could lead to improving upstream water retention and infiltration, de-energising flows and reducing downstream flood risk.²⁰ The Government's use of land across river catchment areas should reflect the benefits of these approaches, which should be integrated into its wider management of flood risk.

5.6. The same approach should be taken to the management of river estuaries and adjacent land, where the management of flood risk can also achieve carbon sequestration, pollution attenuation, and benefits to biodiversity.²¹ The Government should take a landscape approach to identifying where riverbank design and the use of connected land can provide vital ecosystem services which also mitigate flood risk.

6. 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?

- 6.1. Planning and development arrangements should make full use of Sustainable Urban Drainage Systems (SuDS) wherever possible. SuDS can effectively manage run-off water and water pollution through the natural processes of the water cycle, reducing flood risk while also improving water quality. Depending on the context, there may be additional benefits to biodiversity through habitat creation, as well as opportunities to increase carbon storage.
- 6.2. Through increased soil infiltration, SuDS help to control water at its source, reducing the rate of flows and therefore addressing flood risk without shifting that risk to downstream communities. Simultaneously, SuDS can prevent or limit sediment transfer into watercourses, reducing water pollution and the need for downstream dredging which may have consequences for flood risk. By considering the implementation of SuDS carefully at the outset of planning processes and infrastructure developments, measures can be adapted to the specific needs of developments, including for brownfield sites, by including impermeable base layers and carefully selecting SuDS site locations, which can avoid soil contamination or the mobilisation of pollutants into watercourses.²²
- 6.3. For this reason, it is important that SuDS are considered from the outset of planning processes, and that the Government takes a more active approach to embedding these techniques in planning practices. We welcome that the Government's response to the Committee on Climate Change's 2017 Risk Assessment recognised the importance of considering SuDS at the planning stage.²³ However, despite this recognition by the Government, there has historically been poor adoption of SuDS at the planning stage, with the Committee on Climate Change reporting that less than 15% of planning

¹⁹ Committee on Climate Change. (Reference 1).

²⁰ Carver, S. (2016). *Flood management and nature – can rewilding help?* ECOS 37(1). Available at: <https://www.ecos.org.uk/wp-content/uploads/2016/05/ECOS-37-1-32-Flood-management-and-nature.pdf>

²¹ Port of London Authority. (2020). *Estuary Edges*. Available at: <https://www.estuaryedges.co.uk>

²² Scottish Environment Protection Agency (2003). *SUDS Advice Note – Brownfield Sites*. Available at: https://www.sepa.org.uk/media/151526/suds_brownfield.pdf

²³ HM Government. (2017). *Government response to the Committee on Climate Change 2017 Report to Parliament – Progress in preparing for climate change*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/659283/CCS_207_CCS0917051660-1_Un_Act_Govt_Response_to_CCC_Report_2017_Accessibl...pdf

applications in flood risk areas proposed SuDS measures.²⁴ The Government needs to take more active measures in its planning policy to promote SuDS implementation early in the planning process for the effective management of flood risk.

²⁴ Committee on Climate Change Adaptation Sub-Committee. (2014). *Managing climate risks to well-being and the economy*. Available at: www.theccc.org.uk/publication/managing-climate-risks-to-well-being-and-the-economy-asc-progress-report-2014