



Plain dealing

BUILDING FOR FLOOD RESILIENCE

By Grace Newcombe

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Contents

	Acknowledgements	2
	Advisory panel	3
	Executive summary	4
	Introduction	13
1	Planning for climate change and flood resilience	15
2	Flooding policy in the UK	28
3	Living with flooding	45
	Recommendations	54

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Advisory panel

This research project was supported by an advisory panel, whose members are listed below. Advisory panel members provided one-on-one advice and/or attended an editorial roundtable. It must be understood that they may not necessarily agree with every analysis and recommendation made in the report

- Innes Thomson, Chief Executive, Association of Drainage Authorities
- Julie Foley, Director of Flood Risk Strategy and National Adaptation, Environment Agency
- Paul Cobbing, Chief Executive, National Flood Forum
- Samer Bagaeen, Professor of Planning and Resilient Systems, University of Kent
- Ruth Beck, Head of Home Technical Claims, LV= General Insurance
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Executive summary

Planning for climate change and flood resilience

Climate change is having visible effects on the world, with changing rainfall patterns, increased temperatures, and rising sea levels. In the UK, we are already seeing more extreme weather events, including hotter, drier summers, flooding and rising sea-levels also. Despite this, as a nation we have fallen behind on adapting to climate change. Under pressure ahead of COP26, the government has finally published its long-awaited net zero strategy setting out how it plans to meet the country's legally binding 2050 climate goals¹. As such, the UK now has firm commitments that largely mirror the guidance of the Climate Change Committee, but concerns are held around the speed, extent, and funding of the plans, which are tenuous in places. Ultimately, overall progress in planning and delivering adaptation is being outpaced by increasing risk. Consequently, the UK is less prepared for climate change impacts² now than it was when the previous risk assessment was published in 2016.

The frontline of the push to resilience is the planning system. Planning makes a major contribution to both mitigating and adapting to climate change, through decision-making on location, scale, mix and character of development. Planning reform must therefore have climate change at its core. Otherwise, we run the risk of developing a system that fuels, rather than tackles, the climate crisis. In 2011, a relaxation of the planning rules meant local planning authorities no longer having to report cases where they have ignored Environment Agency advice, whilst also making it easier for them to approve planning applications in high-risk areas. The upcoming planning reforms must, therefore, be seen as an opportunity to redress this and strengthen climate risk planning policy, not weaken it, to 'Build Back Better' as part of the government's plan for growth.

The *Planning for the Future* white paper, on which the currently-paused planning reforms are based, is clear in its ambition to erase the existing post-war system. However, where the crucial area of climate resilience is concerned, rather than create a more rigorous system, the proposed reforms in fact create uncertainty with little detail as to the role of the planning system in increasing climate resilience³. If planning policy were to be weakened, Environment Agency (EA)

1 Department for Business, Energy and Industrial Strategy (2021) – Net Zero Strategy: Build Back Greener
2 Climate Change Committee (2021) – Progress in adapting to climate change: 2021 Report to Parliament
3 Centre for Sustainable Energy & the Town and Country Planning Association (2020) – Why the Planning System needs to be at the heart of delivering the UK's Climate Change targets

research has shown that damages from poor planning decisions would engender overwhelming economic harms by building in the wrong places in a way that is neither safe nor sustainable. The issue of flooding, both of existing properties and the building of new properties in high-risk areas, is emblematic of the challenge ahead. Floodplain development sits at the intersection of the housing and climate crises, presenting either an opportunity or obstacle for building back better, depending on policy choice and political governance.

How local government acts within the current system is as crucial to resilience as to how central government carries out reform. Although most local authorities have climate change policies, over the last five years, few can show as yet that their planning policies are designed to secure their area's contribution to full decarbonisation of the UK, as required⁴. As a result, a situation arises where those deciding applications are left with a lack of clear guidance as to whether the proposed developments presented are consistent with their area's decarbonisation plans. It must be recognised however, that local authorities are under huge pressure. In addition to limited planning policy support, they are grappling with increasingly scarce resources coupled with low levels of private-sector investment - making it even more difficult to meet any ambitions for climate change.

Flood risk and development

In 2019, the Climate Change Committee warned that the most recent climate change risk assessment revealed 1.4m people in England face a significant risk of flooding of some kind⁵. The National Audit Office estimated in 2020 that 1.9m homes are at risk of flooding, due to being situated on or near a floodplain⁶. Flood damage can be extensive, causing disruption in the community, infrastructural damage, and even the loss of life. The Bonfield Report found that persistent rain in 2016 caused extensive damage across the country, with 17,000 properties being flooded and costs expected to amount to £1.3bn.^{7 8}

While we cannot quantify the cost of flooding at a local authority level, we can observe the disparity in the overall flood-risk faced by a local authority through looking at the percentage of homes at risk of flooding. For councils at high risk, often on the east coast of England, there is very little choice when it comes to

4 The Planner (2020) – Councils must climate-proof plans

5 Climate Change Committee (2019) – Progress in preparing for climate change – 2019 Progress Report to Parliament

6 National Audit Office (2020) – Managing flood risk: a data visualisation

7 Peter Bonfield OBE (2016) – Each Home Counts: An Independent Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy

8 Environment Agency (2018) – Estimating the economic costs of the 2015 to 2016 winter floods

building on floodplains to meet housing demand under the current system. This is particularly acute in those high-risk districts where 10 percent or more are already at risk of flooding – in South Holland, 34 percent of the district’s land is at high risk of flooding. So far in 2021⁹, these high-risk planning authorities have approved **5,283** new dwellings on floodplains, with **4,255** planned in areas identified as highly likely to flood. In the top five local authorities for flood risk, **31 percent** of approved planning permissions for new residential buildings on floodplains did not come with a Flood Risk Assessment. Clearly, a refresh and revitalisation of governance procedures is needed as we face down ever-increasing risk.

Flooding policy in the UK

In the UK, parliament, the regulatory authorities, and the courts have recognised the dangers of flooding and attempted to address them through regulatory frameworks. In the last two years, the government has published a National Policy Statement on the issue, alongside the Environment Agency’s national Flood and Coastal Erosion Risk Management (FCERM) Strategy and Action Plan (2021), the combined aim of which is to ensure resilience in England towards flooding and coastal erosion. The Policy Statement sets out a long-term approach to commit to making better decisions about the actions and investments taken which account for future risks in a changing climate. The FCERM Strategy, as a requirement of the Flood and Water Management Act (2010), seeks to invest £5.2bn in flood schemes over the next six years, with over £860m expected to support flood alleviation schemes in 2021¹⁰.

The moves were broadly welcomed and provided a “positive message for communities” but some experts said maintenance budgets for flood defences would also need to rise and that local authorities still needed more resources¹¹. For the FCERM strategy, while the ambition is for councils to continue to work with partners to create climate resilience places, they are not able to take on the level of additional activity that the strategy proposes without significant additional investment. Positively, the strategy recognises that the tools needed to deliver resilience will vary from place to place, that there is not a ‘one size fits all’ approach and that it is best designed at a local, rather than national level. Yet, at the same time, the strategy assumes that the present funding model will continue in its current format, which allocates funding on a prioritised basis according

9 Up to 20th September 2021 - Methodology note for planning register analysis

10 HM Government (2020) – Flood and coastal erosion risk management: Policy Statement

11 The Guardian (2021) – Record funding for flood defences in England as climate crisis worsens risks

to national outcome measures and does not lend itself to deliver flexible local place-based solutions. There is a need to look at existing funding mechanisms for funding flood and coastal resilience to establish whether they are suitable and supportive of a resilience-focused flooding and coastal change agenda.

Additionally, the National Planning Policy Framework provided a set of guidance in relation to floodplain development¹². It stated that, “inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere”. This highlighted the key goal of avoiding developments that could suffer from a flood risk, should they be made in areas designated as being inappropriate due to the natural hazard. However, it also stated that developments could be made so long as safety measures were taken in case of flooding. In an October 2021 report, the Environment Agency doubled down on their FCERM guidance, issuing a stark warning: adapt or die¹³. The agency has warned of more extreme weather leading to increased flooding and has urged governments, businesses, and society to embrace and invest in adaptation, rather than living with the costs of inaction.

Problems with the current system

While national planning policy in England should steer development away from current flood risk areas and advises that future risk should be considered, at present there is no clear policy for how local authorities should effectively account for the flood risk associated with increasing climate change in plans and development decisions. Thus, faced with competing interests and institutional agendas such as constraints on building on protected land (e.g. the green belt around urban areas in England) and pressure to meet national housing targets, local authorities frequently permit new developments in flood zones¹⁴. The complex nature of this issue – local authorities, under-resourced and under pressure to deliver housing targets, working in something of a grey area – highlights the asymmetrical central-local relationship that exists in this area of governance.

There is a huge mismatch between central and local relations regarding flood risk management, one affecting the entire journey from local plan to development control. This has led to data gaps, a lack of ambition and subsequent lack of

12 Department for Levelling Up, Housing & Communities – National Planning Policy Framework

13 Environment Agency (2021) – Adapt or die, says Environment Agency

14 Viktor Rözer and Swenja Surminski (2020) – New build homes, flood resilience and environmental justice – current and future trends under climate change across England and Wales

effective action and change. Complexity is borne from the multitude of bodies involved in flood risk and service management. In England, local authorities are responsible for housing (district councils in county/district areas), with the county council (if it is a two-tier authority) responsible as the statutory consultee for surface water drainage. Meanwhile the EA is responsible for flood risk and a private water company is responsible for drainage. When there is an emergency, these roles are slightly different and don't align in the same manner. The district council is responsible for evacuation, with the county council focusing on provision of alternate accommodation.

The defunding of local authorities since 2010 has naturally had an impact on the ability of councils to manage this complex issue. Just 12 percent of local authorities strongly agree that they have the skills and expertise to take account of flood risk now and in the future in planning decisions¹⁵. Despite over 60 percent of councils declaring climate emergencies, local authorities have a critical shortage of skills and expertise in relation to planning for climate change. For example, only two percent of local authorities are considering future insurance availability and affordability when making planning decisions, and only a third of local authorities are seriously considering the impacts of climate change when deciding whether to grant planning permission¹⁶. As local decision-makers, it is paramount that local authority planning departments are better resourced to deal with the flood risk challenges they are facing, both now and into the future.

Role of insurance and Flood Re

A key private institutional actor in the governance of flood risk is the insurance sector. Widespread flooding causes a dramatic increase in insurance claims which, in the past, have led to large rises in premiums for insurers. As a result, the government and insurers developed a new system of re-insurance, Flood Re, which promotes the availability and affordability of flood insurance to those who own and live-in properties in flood risk areas. Since the start of the scheme, 300,000 people have gained access to flood insurance where they didn't previously. However, it is not a perfect system and so far has not led to a steer away from floodplain development.

One stipulation of Flood Re is that only properties built before 2009 would be covered to discourage developers from building on floodplains. Yet this has not been an effective deterrent at all – housing has continued to be built on these high

15 Town and Country Planning Association (2020) – Blog: Loss of skills and power: is local government critically unprepared for the climate crisis?

16 Ibid.

flood risk areas. Furthermore, there is an issue of uptake and communication. The 2020 Blanc review was undertaken in Doncaster following the devastating flooding in November 2019 and was one of the first opportunities to look at the adequacy of Flood Re insurance scheme in practice¹⁷. The review found sizeable differences between owner-occupiers and tenants with more tenants being poorly protected. Yet, even 28 percent of owner-occupiers were not covered¹⁸. If repeated across the country, this could mean tens of thousands of vulnerable households would be unnecessarily unprotected against flooding and failing to access the support set up to help them.

Living with flooding

As an island nation situated where several major weather patterns meet – including the increasingly erratic Gulf Stream – there's a four-sided problem facing the UK¹⁹:

1. To meet the UK's growing housing needs we have little choice but to build on flood-prone development sites.
2. Major storms that saturate the ground are increasing the volume of rainwater run-off to swollen rivers and waterways.
3. Climate change will lead to average sea levels rises this century of close to two metres.
4. This will increase coastal and estuary flooding, force rivers back onto floodplains, pushing water further inland.

In determining effective strategies, decisions-makers need to look at enhancing the resistance of the system, its resilience, or consider refraining from development on floodplains entirely.

Resistance, resilience, and refrain

The traditional strategies in developed countries, focusing mainly on the hazard of flood risk by aiming at flood prevention, can be considered resistance strategies²⁰. Resistance strategies involve uncertainties by assessing and including them in the flood probability while over-dimensioning flood prevention structures.

17 Amanda Blanc (2020) – Independent Review of Flood Insurance in Doncaster

18 Climate Change Committee (2021) – Progress in adapting to climate change: 2021 Report to Parliament

19 Enzygo (2020) – Flood Plain – Mitigation vs. Resilience

20 Karim M. De Bruijn (2003) – Resilience strategies for flood risk management under uncertainties

There are a lot of floodplains that are currently defended, providing a level of protection that might enable appropriate housing developments. This ranges from large scale hard defences such as the Thames Barrier and self-closing flood barriers in Cockermonth²¹, Cumbria, to the more traditional approach of riverside floodwalls and embankments as can be seen along the River Severn²². And in this situation particularly, flood defences prove that they are critical in defending people's homes. However, with increasingly heavy rains and rising sea levels due to climate change, as Environment Agency Chair, Emma Howard Boyd points out: "we cannot win a war against water by building higher flood defences". As a stand-alone measure, in the face of climate change they have limitations, the foremost of which are the costs of erecting and maintaining flood defences. As it stands, unless long-term changes are made, on current trends insufficient funding is being allocated to maintain flood defences indefinitely. The October 2021 Environment Agency report to government emphasises that deadly events such as the flooding in Germany this summer would hit the UK if the country did not make itself resilient to the more violent weather the climate emergency was bringing²³.

Resilience is an holistic approach to flood risk management, focusing on the balance between the socio-economic situation, the physical situation, and the climatic variability. Resilience strategies focus on living with floods instead of preventing them, relying on a flexible response to floods and a rapid recovery from them²⁴. Flood risk management is an issue of risk, balancing which risks are acceptable to take. Resilience involves accepting that with climate change, even with resistance and resilience measures to flooding, repeated flooding will be experienced as areas increase in flood risk. Flood resilience works on multiple scales, and to 'Build Back Better', it must be remembered that a flood resilient building is only the beginning. Communities need to understand their risk to flooding and coastal change, know their responsibilities and how to act. To do this, people need to be educated and inspired to act pre-emptively, before flooding or coastal change happens. Resilience has a role to play but it isn't the silver bullet, and you can only go so far with such strategies. To be truly effective, principles of resilience must be ingrained among the public.

The Public Accounts Committee said it makes no sense to keep allowing houses

21 CarbonBrief (2017) – Mapped: Where £4.4bn is being spent on flood protection in England

22 South Gloucestershire Newsroom (2020) – West of England Enterprise Area flood defence work gathers pace

23 Environment Agency (2021) – Adapt or die, says Environment Agency

24 Karim M. De Bruijn (2003) – Resilience strategies for flood risk management under uncertainties

on floodplains where climate change means the risk of flooding is continually on the rise²⁵. The panel of MPs advocated for legislation to change planning policy and halt building in areas vulnerable to flooding after warning of gaps in flooding risk protection and funding concerns. They argued that the government is not intervening to prevent new homes being built on floodplains, and that more needs to be done to combat the exorbitant home insurance costs that result. While government policy is not to build on floodplains unless unavoidable, there could still be a large increase in the number of houses built on flood plains over the next 50 years²⁶. Despite this, the fact remains that we live on an island with limited capacity to meet the growing housing demands. Is opting out of building on floodplains the most realistic and practical option?

Going forward

Imminent tests are coming up for flood risk management, specifically around the planning reforms and the call to 'build back better'. The planning reforms could be seen as an opportunity to strengthen flood risk planning policy, not weaken it. However, flood risk adaptation does not have a strong enough presence at the moment. Advisory bodies such as the EA can only provide guidance on what exists; if there isn't a supportive planning policy then flood risk adaptation will remain ephemeral. Currently the country is in a period where the focus is understandably on building and recharging the economy. Yet equal focus must be placed on good adaptation, placemaking and 'building back better'. There is a trade off-here with investment in every aspect - projects, skills, capabilities - required for adaptation and resilience. The planning system - along with how new resources announced at the 2021 spending review are allocated - will ultimately influence the framework for flood resilience and adaptation going forward into the foreseeable future.

25 Construction News (2021) – Flood protection is the 'next major building scandal', MPs warn

26 Public Accounts Committee (2021) – Managing flood risk

Recommendations

• **Planning reforms**

- Floodplain development should be avoided wherever possible and should be accompanied by appropriate flood defences, constructed alongside new developments, where unavoidable.
- Local authorities with planning teams should appoint a chief resilience officer who is:
 - Required to sit on local resilience forums.
 - To become a single point of contact for English local government districts on the issue in county/district areas, or in unitary authorities depending on governance systems.

• **Funding recommendations**

- Specific funding should be made available to establish a new cross-departmental task force to look at flood-risk development. A new ministerial post, between Defra and DLUHC, should be set up to oversee and provide accountability for this task force.
 - This would include provision for:
 - engagement with, and capacity training for, local authority planning teams (particularly chief resilience officers);
 - design and funding of graduate schemes for flood resilience professionals in planning, water management and other key disciplines;
 - serving as a single point of contact for central government on the issue.
- Money must be made available for upgrading maintaining flood defences (overseen by task force)
 - a blended mix of revenue allocation via the Environment Agency to local authorities and to internal drainage boards, to undertake essential work on existing flood defences going forward. This may well involve a period of just a few years where we frontload a significant amount of public money to bring our assets up to a condition that is easier to manage than on a 'little and often' basis.

• **A future risk-based approach to development**

- The insurance industry should work with the government, local authorities, developers and other key stakeholders to help inform what measures might be needed in the future to help mitigate against climate change and ensure that homes are and remain insurable.

Introduction

There is much riding for the government on the back of its 'Building Back Better' agenda as a ubiquitous mantra. Equally, having set in law the world's most ambitious climate change target to cut emissions more than three quarters of the way by 2035 compared to 1990 levels, departments are being commissioned across Whitehall to achieve the ambitious cross-government Net Zero Strategy, published in October 2021. But building back better risks being merely a vapid slogan if the overriding domestic political issue, the long-term failure to fix a broken housing market, isn't addressed. This means the actual building of beautiful homes for new and existing communities at scale, at affordable levels for first-time buyers, and in parts of the country where demand is greatest.

However, analysis of planning permissions reveals there are currently schemes to build thousands of homes in high-risk flood zones throughout the UK. There is a real risk that in focusing on the twin goals of net zero and housing targets – amid the minefield of contentious planning reforms – the impact of climate change gets overlooked given the political expedience of granting planning permission away from existing settlements.

According to the findings of the Climate Change Committee's Independent Assessment of UK Climate Risk, the UK is falling behind on adapting to climate change – with the need for additional adaptation above what has been already planned, having increased in the last five years. The general pattern of change in the UK is towards warmer and wetter winters, hotter and drier summers, with high variability. These changes will increase our exposure to weather-related hazards, leading to increases in average and extreme temperatures, in winter and summer, changes to rainfall patterns, leading to flooding in some places, at some times, and water scarcity in others.

The issue of flooding, both of existing properties and the building of new properties in high-risk areas, is emblematic of the challenge ahead. Floodplain development sits at the intersection of the housing and climate crises, presenting either an opportunity or obstacle for building back better, depending on governance. Measures to improve both resistance and resilience to flooding have the potential to both stimulate building back better and safeguard future housing supply on an island with a growing population. To move towards this outcome – and avoid a situation of an ever-increasing number of homes, along with their owners and occupants, facing significant annual risk of extremely damaging flooding events – the correct policy steps must be taken. This report surveys the current landscape, in the vital context of climate change and housing demand and

presents some policy prescriptions to ensure that new homes are built in the right places with the appropriate resilience measures.

CHAPTER ONE

Planning for climate change and flood resilience

The issue of climate resilience has come to the fore in 2021, with extreme weather events up and down the UK acting as reminders that climate change is very much an ongoing process. The planning system must absorb and adapt to new circumstances wrought by climate change, with flooding a particular area of concern. This is most clearly manifest at the local level, where multiple pressures arise from the twin challenges of increasing housing supply and mitigating against flood risk.

1.1 Climate change and its increasing impact

Climate change is the greatest long-term challenge facing the world today – per the first sentence in the Intergovernmental Panel on Climate Change’s most recent report, “it is unequivocal”²⁷. The climate crisis is unequivocally caused by human activities and is unequivocally affecting every inch of the planet.

Climate change is having visible effects on the world, with changing rainfall patterns, increased temperatures, and rising sea levels. The 2010s were the hottest decade on record globally, driving dangerous weather patterns and affecting societies and ecosystems around the world²⁸. Without a much stronger and urgent effort towards tackling climate change, we will breach 1.5°C of warming within the next two decades and suffer for our unpreparedness²⁹. In the UK, we are already seeing more extreme weather events, including hotter and drier summers, flooding and rising sea levels. There will be permanent changes in the natural environment but also, and increasingly, substantial challenges to national prosperity and social cohesion, for which we need to prepare and adjust. There is therefore an urgent need for action on climate change.

As host of the COP26 UN climate talks, the UK has a heightened responsibility to implement effective climate action and serve as a driver of global efforts. The UK has a strong track record in parts, but is falling behind on adapting to climate change as governmental approaches to climate change have been consistently characterised by failure to meet their own specified aims and targets and complacency in the face of this failure³⁰.

Under pressure ahead of COP26, the government published its long-awaited Net Zero Strategy setting out how it plans to meet the country’s legally binding 2050 climate goals³¹. As such, the UK now has firm commitments or “ambitions” that largely mirror the guidance of the Climate Change Committee, involving an expansion of electric vehicles, further growth of offshore wind and investments in new technologies such as hydrogen and sustainable aviation fuel³². The strategy also includes a £3.9bn plan for decarbonising heat and buildings. The commitments made secure 440,000 “well-paid” jobs, recognise the skills reform needed, and leverage £900bn in private investment; business reaction to the strategy was mainly positive.

27 IPCC (2021) – Climate Change 2021: The Physical Science Basis

28 Climate Change Committee (2021) – Progress in adapting to climate change: 2021 Report to Parliament

29 IPCC (2021) – Climate Change 2021: The Physical Science Basis

30 Peter Somerville (2020) – The continuing failure of UK climate change mitigation policy

31 Department for Business, Energy and Industrial Strategy (2021) – Net Zero Strategy: Build Back Greener

32 CarbonBrief (2021) – In depth Q&A: The UK’s net-zero strategy

Yet a parallel document – the Net Zero Review – published by the Treasury, was less assured³³. It said action on decarbonisation is “part of the government’s commitment to strong public finances” but raised concerns about the loss of fuel and vehicle excise duty – which raised £37bn last year – as drivers switch from fossil fuels. Any additional public spending on decarbonisation might mean changes to existing taxation and “new sources of revenue”.

Green campaigners question the speed, extent, and funding of the plans. Rebecca Newsom, the head of politics at Greenpeace UK, said: “This document is more like a pick and mix than the substantial meal that we need to reach net zero. Extra cash for tree planting³⁴ and progress on electric vehicles doesn’t make up for the lack of concrete plans to deliver renewables at scale, extra investment in public transport, or a firm commitment to end new oil and gas licences³⁵.”

The UK has a strong climate framework under the Climate Change Act (2008), with legally binding emissions targets, a process to integrate climate risks into policy, and a central role for independent evidence-based advice and monitoring. The UK has undertaken three comprehensive assessments of the climate risks facing the nation and the government has published plans for adapting to those risks. There have been some actions in response, notably in tackling flooding, but overall progress in planning and delivering adaptation is being outpaced by increasing risk. Consequently, the UK is less prepared for climate change impacts now than it was when the previous risk assessment was published in 2016³⁶. Delays in policy and implementation continue, adaptation policy desperately needs a step-change in ambition and action and to be embedded throughout government policies, the delivery of which must accelerate and broaden. The frontline of the push to resilience is the planning system.

1.2 The planning system

1.2.1 Incorporating climate change

Any new planning system must have climate change as its first legal and policy priority. Planning makes a major contribution to both mitigating and adapting to climate change, through decision-making on location, scale, mix and character of development. At its best, planning can create the most cost-effective policy choices for carbon reduction and do that as part of a wider democratic conversation with

33 HM Treasury (2021) – Net Zero Review Final Report

34 Guardian (2021) - Row over UK tree-planting drive: ‘We want the right trees in the right place’

35 Guardian (2021) – UK’s net zero plan falls short on ambition and funding, say critics

36 Climate Change Committee (2021) – Progress in adapting to climate change: 2021 Report to Parliament

the local community. It is fundamental to successfully find sustainable locations and of designing places that support long-term residency for the benefit of householders and the community.

Addressing climate change is therefore the government's principal concern for sustainable development and includes securing resistance to climate change impacts in a holistic, whole systems approach. All planning policies, strategies, and the decisions taken in support of them must reflect the government's zero-carbon ambitions and the Climate Change Act 2008. However, there is a genuine dilemma in terms of planning reforms, ambitions for growth and climate adaptation – how to manage them all?

In 2020, the government launched the Planning for Future white paper promising a radical overhaul of the planning system through the stripping away of red tape to produce a 'significantly simpler, faster and more predictable [planning] system'³⁷. In May 2021, many of the core ideas of the white paper were due to be embedded in the Planning Bill, originally scheduled to be brought forward in Autumn 2021. The white paper is clear in its ambition to erase the existing system, but rather than create a more rigorous system, it creates uncertainty about the role of the system and how the new proposals will tackle the current climate crisis³⁸. Planning reform must have climate change at its core, otherwise we run the risk of developing a system that fuels, rather than tackles, the climate crisis.

In July 2021, the National Planning Policy Framework (NPPF) was updated. Since its conception in 2012, each revision has diluted and de-prioritised action on climate change³⁹. As climate change slowly slips off planners' radar, the new 2021 NPPF has failed to address the seriousness of the climate emergency, downgraded planning's contribution towards combating climate change, and in doing so has also failed to bind the planning system to the UK's climate policy. The upcoming planning reforms should be seen as an opportunity to strengthen climate risk planning policy, not weaken it, to 'Build Back Better' as part of the UK government's plan for growth. If planning policy is weakened, Environment Agency (EA) research has shown that damages from poor planning decisions will have overwhelming economic damages by building in the wrong places in a way that is not safe or sustainable. The cost

37 Department for Levelling Up, Housing and Communities – Planning for the Future: White Paper August 2020

38 Centre for Sustainable Energy & the Town and Country Planning Association (2020) – Why the Planning System needs to be at the heart of delivering the UK's Climate Change targets

39 Centre for Sustainable Energy (2018) – Why the government's new planning framework shouldn't water down action on climate change

to the economy is very significant in terms of the legacy of impacts. The role of planning is fundamental and one of the key pivotal levers of how you achieve climate change resilience.

1.2.2 The local level

With the NPPF being so instrumental in planning policy throughout England and at all levels of government, overlooking climate change in planning obligations extends to local authority influence as well. There is a legal duty under the Planning and Compulsory Purchase Act 2004 to ensure that climate change mitigation and adaptation are core objectives integrated across all local planning policy⁴⁰. Additionally, under the Strategic Environmental Assessment (SEA) regulations, there is a legal obligation to assess the consistency of planning policy with wider climate change objectives. However, a 2016 survey conducted by the Town and Country Planning Association found that compliance with this obligation is poor with only 30 percent of the authorities surveyed having assessed policy carbon impacts, with no suggestion that this track record has improved since⁴¹.

Although most local authorities have climate change policies, over the last five years, few can show that their planning policies are designed to secure their area's contribution to the full decarbonisation of the UK, as required. As a result, a situation arises where those deciding applications are left with an absence of clear guidance as to whether the proposed developments presented are consistent with their area's decarbonisation plans. The Royal Town Planning Institute highlighted that "without adequate planning systems and policies, there is no realistic way to progress to zero carbon" and that "nothing should be planned without having successfully demonstrated it is fit to take its place in a net-zero emissions future"⁴². It is the only cost-effective, resilient, and sustainable way to plan.

It must be recognised however, that local authorities are under huge pressure. In addition to limited planning policy support, they are grappling with increasingly scarce local authority resources coupled with low levels of private-sector investment making it even more difficult to meet any ambitions for climate change.

1.3 Flood risk: immediate and increasing

While growth in exposure to flooding is a major driver of flood risk, this is likely

40 The Planner (2020) – Councils must climate-proof plans

41 Town and Country Planning Association (2016) – Planning for the climate challenge? Understanding the performance of English local plans

42 The Planner (2020) – Councils must climate-proof plans

to be dwarfed by the effects of climate change induced sea level rise and changes in rainfall over the coming decades⁴³. Met Office research in 2017 found that climate change means there is “a high chance of exceeding the observed record monthly rainfall totals in many regions of the UK”⁴⁴. Analysis by the Met Office shows that on average, for the decade 2010 to 2019, UK summers were 13 percent wetter, and winters 12 percent wetter than over the previous 50 years⁴⁵. Meanwhile, scientists have estimated that extreme heavy rainfall events such as Storm Desmond, which affected Northern England in December 2015, have been made about 40 percent more likely by human-driven climate change⁴⁶.

Floods are the most common form of natural disaster across the world with wide ranging effects suffered by many communities⁴⁷. Riverine and coastal floodplains occupy 12 percent of the area of England and have been populated for centuries, now accounting for eight percent of land with property developments⁴⁸. George Fleming, past president of the Institute of Civil Engineers, states that “floods are a natural occurrence and the risk they pose is wide ranging⁴⁹. However, for society, the focus is the risk to people and property.”

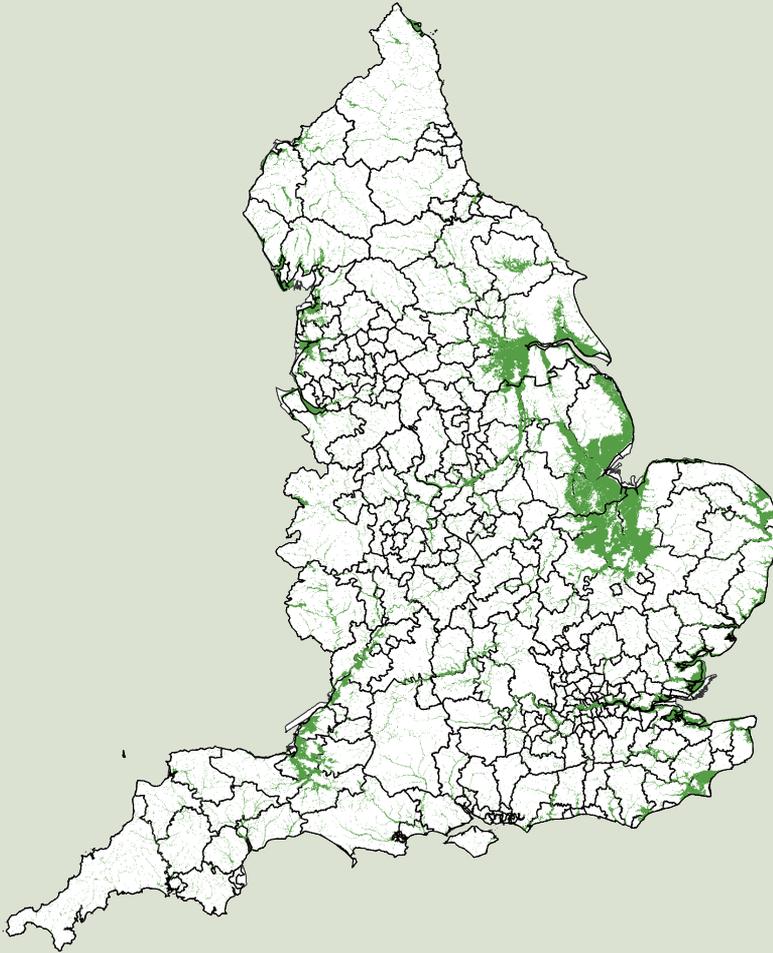
What is a floodplain?

A floodplain is a generally flat area of land close to a river or a stream that is prone to flooding⁵⁰. Despite being part of the riverine landscape, and an extension of the river, flood plains have historically been ideal places to develop human settlements⁵¹. However, as natural flooding outlets for rivers, people, agriculture, and businesses on flood plains are always, always at some risk. Even the most managed rivers will flood. Engineers and city planners working in floodplains must incorporate flood-control infrastructure into their organisation and architecture.

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- 43 Andrew J. Stevens, Derek Clarke & Robert J. Nicholls – Trends in reported flooding in the UK: 1884–2013
- 44 Vikki Thompson et al (2017) – High risk of unprecedented UK rainfall in the current climate
- 45 Met Office (2019) – UK Climate Projections: Headline Findings
- 46 The Guardian (2020) – UK must prepare for more intense storms, climate scientists say
- 47 Debby Guha-Sapir et al (2010) – Annual Disaster Statistical Review 2010
- 48 Committee on Climate Change (2012) – Four times as many properties at risk of flooding if no action taken to prepare for climate change
- 49 George Fleming (2002) – Learning to live with rivers – the ICE’s report to government
- 50 National Geographic Encyclopaedia – Floodplain
- 51 Melissa Parsons and Martin Thoms – Floodplains aren’t separate to a river — they’re an extension of it. It’s time to change how we connect with them

There is a lot of focus around river flooding and floodplains, but surface water flooding also plays a part, occurring when an urban drainage system is overwhelmed, and water flows out onto streets and nearby structures. During the storms Ciara and Dennis, a significant proportion of people who experienced flooding because of surface water.

Figure 1. Category 3 flood risk areas in England



1.3.1 Property development and damage

In 2019, the UK Climate Change Committee warned that the most recent climate change risk assessment revealed 1.4m people in England face a risk of 1:75 or greater flooding of any kind⁵². Consequently, there is a 1.33 percent chance of flooding in any given year, with associated damages to homes costing £270m annually. The number of people at this level of risk could increase to 1.7m if global warming reaches 2°C above the pre-industrial temperature.

In England, some five million properties – one in six – are at risk of flooding⁵³. Of these, 2.4m properties are at risk of flooding from rivers or the sea and 3m are susceptible to surface water flooding⁵⁴. Ten percent of all new homes in England since 2013 have been built on land at the highest risk of flooding. Data from DLUHC shows that the number of new houses built on land at the highest risk of flooding has risen from 9,500 in 2013 to 20,000 in 2017-18, following a peak of nearly 24,000 the previous year. England is likely to see almost double the number of properties in Flood Zone 3 – an increase from 2.4m to 4.6m – over the next 50 years⁵⁵.

Flooding source	2014-15	2015-16	2016-17	2017-18	2018-19
Rivers and the sea	2.4m	2.7m	2.7m	2.6m	2.5m
Surface water	3m	3m	3.2m	3.2m	3.2m
Rivers, the sea, and surface water	600,000	600,000	660,000	660,000	660,000
Groundwater*	122,000-290,000	122,000-290,000	122,000-290,000	122,000-290,000	122,000-290,000

*Figures for groundwater and surface water may overlap in some instances

Source: DLUHC

Flood damage from both floodplains and surface water can be extensive, causing disruption in the community, infrastructural damage, and the loss of life. The Bonfield Report found that persistent rain in 2016 caused extensive damage across the country, with 17,000 properties being flooded and costs expected to

52 Climate Change Committee (2019) – Progress in preparing for climate change – 2019 Progress Report to Parliament

53 National Audit Office (2014) – Strategic flood risk management

54 Ibid.

55 Climate Change Committee (2019) – Progress in preparing for climate change – 2019 Progress Report to Parliament

amount to amount to £1.3bn⁵⁶ ⁵⁷. Storm Dennis resulted in a woman being swept away by floodwater in Worcestershire and over 1,400 properties being flooded across several counties⁵⁸. While we cannot quantify the cost of flooding at a local authority level, we can observe the disparity in the overall flood-risk faced by a local authority by looking at the percentage of homes at risk of flooding.

56 Peter Bonfield OBE (2016) – Each Home Counts: An Independent Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy

57 Environment Agency (2018) – Estimating the economic costs of the 2015 to 2016 winter floods

58 House of Commons Library (2020) – Research briefing: Autumn and winter floods, 2019-20

Figure 2: Percentage of homes at risk of flooding

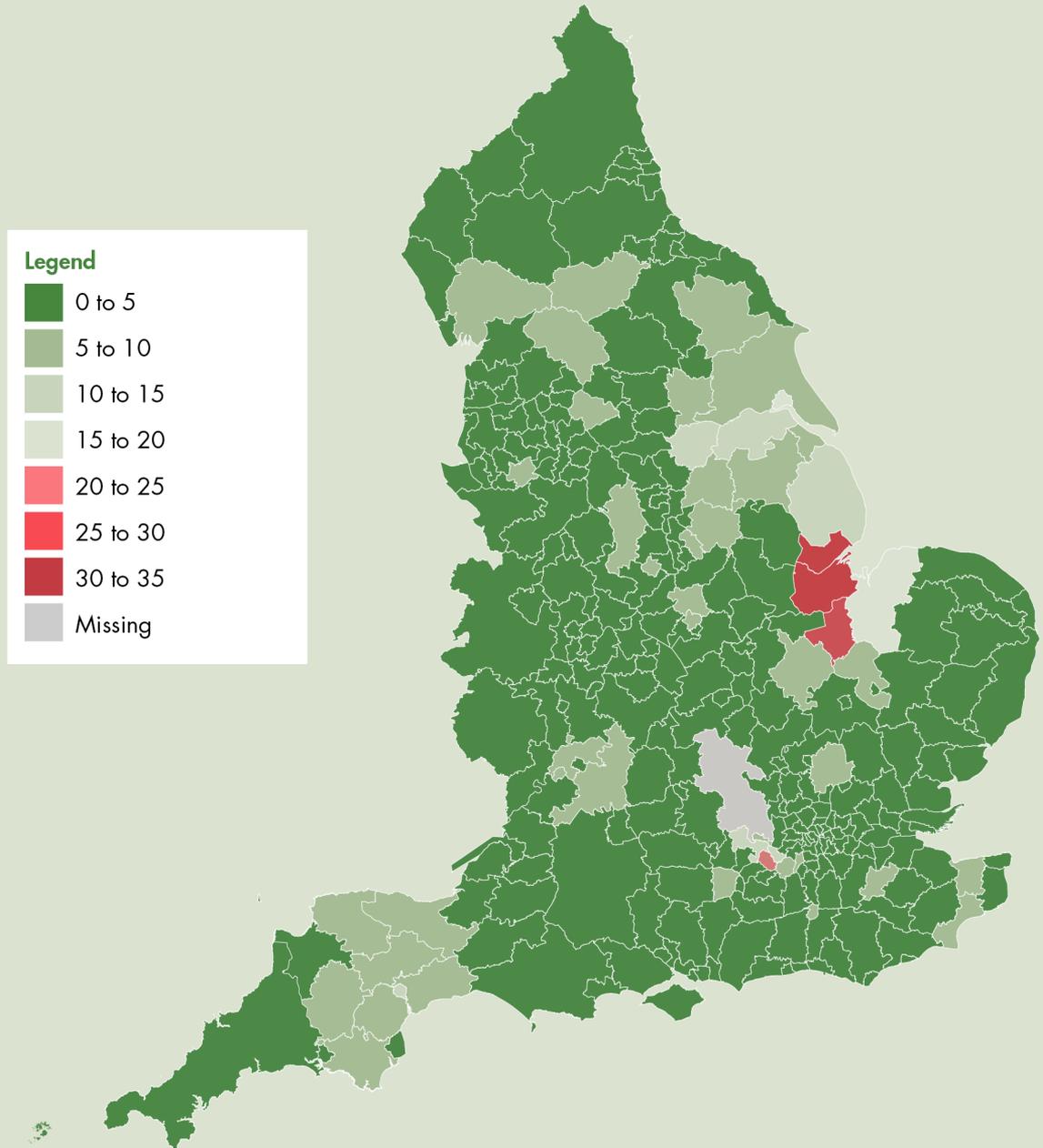
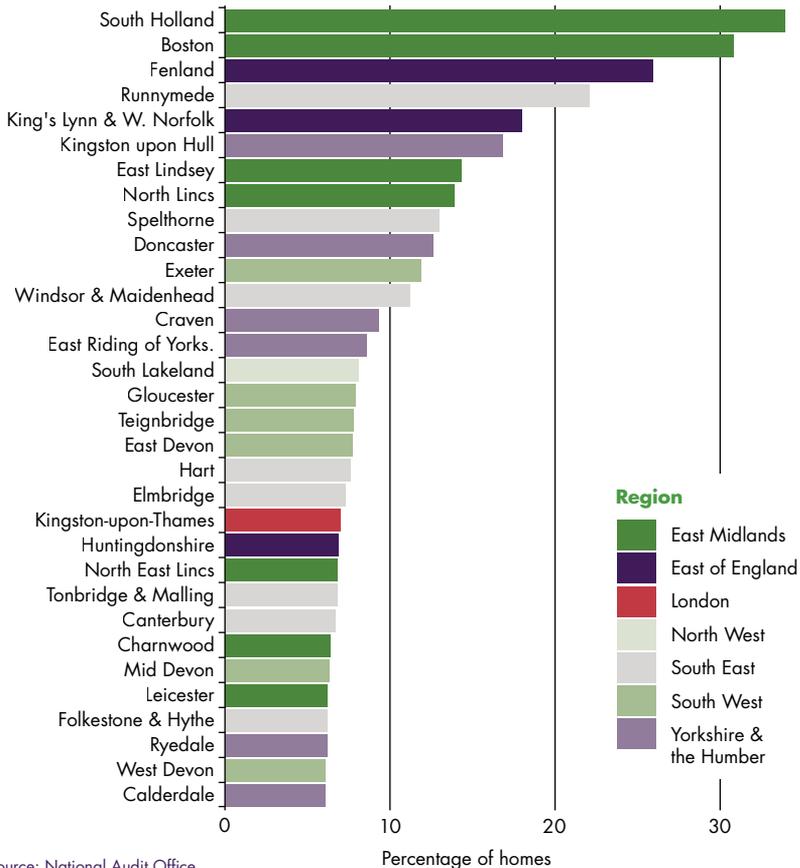


Figure 3. Top 10% of local authority districts
Proportion of homes at significant flood risk



Source: National Audit Office

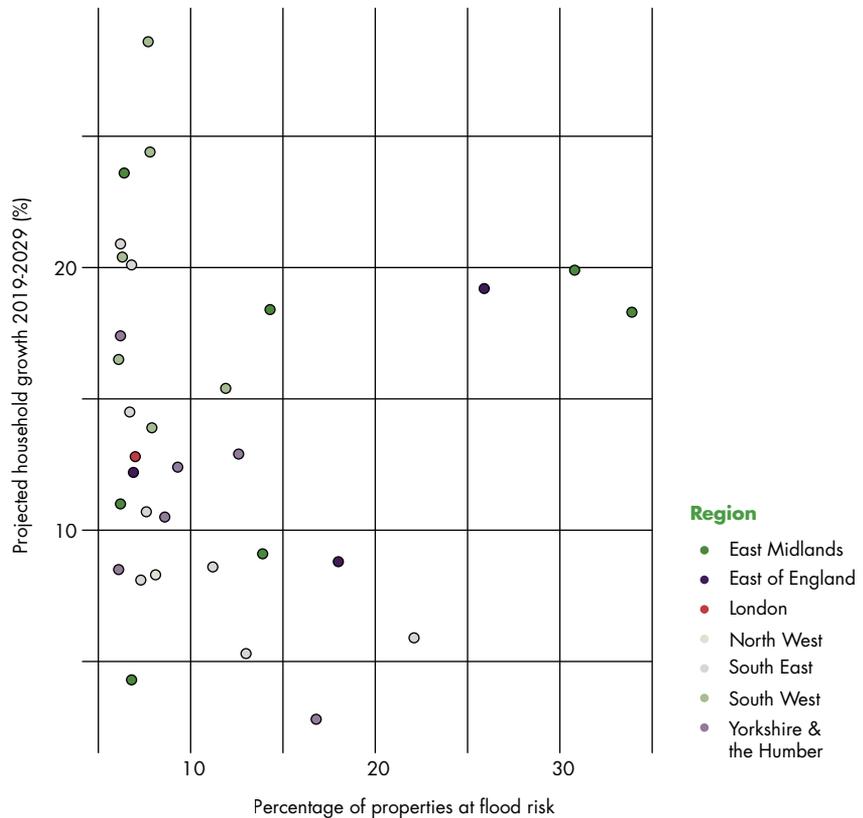
12 local authorities in England have more than 10 percent of their current homes at significant risk of flooding:

1. South Holland
2. Boston
3. Fenland
4. Runnymede
5. King's Lynn & West Norfolk
6. Kingston-upon Hull
7. East Lindsey

8. North Lincolnshire
9. Spelthorne
10. Doncaster
11. Exeter
12. Windsor & Maidenhead

These districts are generally clustered along the east coast of England, with a few exceptions in the South East. For many of these local authorities at high risk of flooding, there is very little choice when it comes to building on floodplains to meet housing demand under the current system, the graph below compares household projections and flood risk for the top 10 percent of local authorities for homes already at risk.

Figure 4. Flood risk and household projections



This is particularly acute in those high-risk districts where 10 percent or more are already at risk of flooding – in South Holland, 34 percent of the district's land is at high risk of flooding in some areas. So far in 2021, these high-risk planning authorities have approved at least new 5283 dwellings in flood zones 2 and 3, with 4255 planned in flood zone 3, which have the greatest probability of flooding (>1%). In the top 5 local authorities for flood risk, 31 percent of approved planning permissions for new residential buildings on floodplains did not come with a Flood Risk Assessment. Clearly, a refresh and revitalisation of governance procedures is needed as we face down ever-increasing risk.

CHAPTER TWO

Flooding policy in the UK

As the issue of flooding and broader climate change resilience intensifies, it is important to understand the allocation of responsibilities across the public and private sector under the current policy framework. Multiple steps have been taken by the government in the past decade, some backwards and some forwards, towards flood resilience.

It is an issue of extreme complexity, exacerbated by this inconsistency and the asymmetrical nature of the institutional relationships involved, with multiple government agencies and financial institutions involved. Attempts to mitigate and adapt to the effects of increased flooding combined with increased housing demand must traverse this uneven policy landscape.

2.1 Flood risk management, governance, and legislation

There is no single body responsible for managing flood risk⁵⁹. Defra is the policy lead for flood and coastal erosion risk management in England. New or revised policies are prepared with other parts of government such as the Treasury, the Cabinet Office (for emergency response planning) and the DLUHC (for land-use and planning policy). These national policies are then delivered by Risk Assessment Management Authorities (RMAs) which are⁶⁰:

Institution	Roles and Responsibilities
Environment Agency	<ul style="list-style-type: none"> • Responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion and are responsible for managing the risk of flooding from main rivers, reservoirs, estuaries, and the sea. • They issue flood warnings in partnership with the Met Office. • Provide information on areas at risk of river and coastal flooding through flood risk maps
Lead Local Flood Authorities	<ul style="list-style-type: none"> • LLFAs are Unitary or County Councils and are responsible for coordinating flood risk management in their area. • Are responsible for managing the risk of flooding from surface water, groundwater and ordinary watercourses and lead on community recovery. • They are responsible for maintaining a register of flood risk assets and surface water risk. • If a flood happens all local authorities must have plans in place to respond to emergencies.
Local Authorities	<ul style="list-style-type: none"> • Carry out flood risk management works on minor watercourses and surface water flooding, working with LLFAs and others.
Planning Authorities	<ul style="list-style-type: none"> • The planning authority is often the local borough or district council. National Park authorities and the Broads Authority are also local planning authorities. • They are responsible for developing local plans, setting out how areas will develop in the future. • They also make decisions through planning committees on which planning applications get approval. • Communities can shape development in their areas through the production of neighbourhood plans.

⁵⁹ Local Government Association – Managing flood risk: roles and responsibilities

⁶⁰ National Flood Forum – Who’s Responsible for What

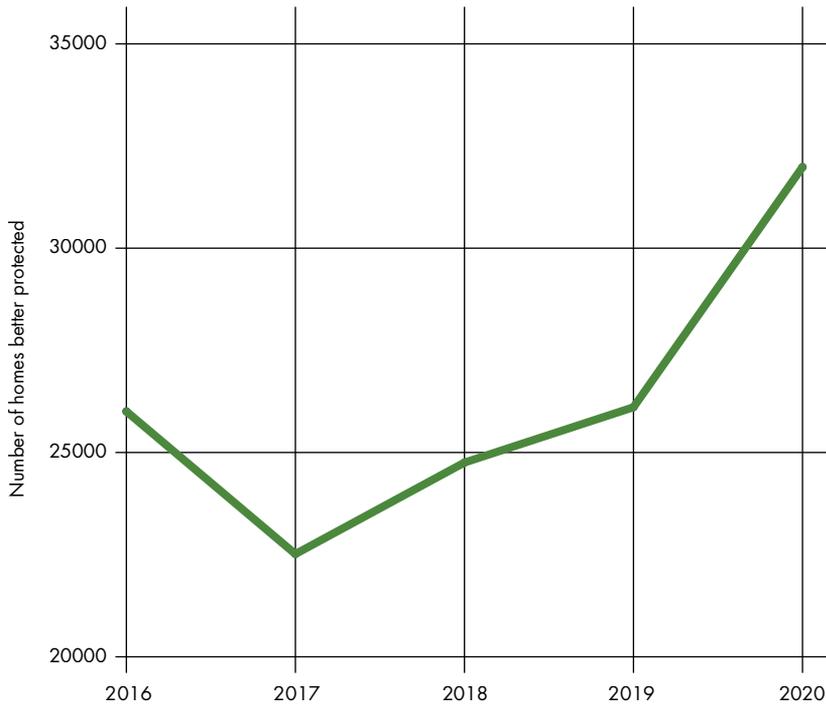
Internal Drainage Boards	<ul style="list-style-type: none"> • IDBs are independent public bodies responsible for water level management in low lying areas (approx. 10 percent of England), working in partnership with other authorities
Water and sewerage companies	<ul style="list-style-type: none"> • Water and sewerage companies are responsible for managing the risks of flooding from piped water and foul or combined sewer systems providing drainage from buildings and yards.
Riparian owners	<ul style="list-style-type: none"> • Owns land or property next to a river, stream or ditch and has responsibilities to maintain the waterway but also rights to protect the property from flooding.
Property owners	<ul style="list-style-type: none"> • Responsible for looking after their own property, including reducing the risks of water entering it and of causing damage.

2.2 Legislation and regulation

In the UK, parliament, the regulatory authorities, and the courts have recognised the dangers of flooding and attempted to address them through regulatory frameworks.

One component to manage floods in a risk-based approach is to avoid increases in exposure by shifting development to areas with the lowest flood risk probability. In this context, the Planning Policy Guidance was introduced in 2001 in England and Wales making the Environment Agency a statutory consultee on applications for planning permissions in flood risk areas. It requires the local planning authorities, who are largely independent in setting their local development plans, to perform a so-called sequential test that aims to prevent new developments from being permitted in areas known to be at risk from flooding. In case this is not possible, an exception test can be applied which regulates development in areas with higher flood risk under the condition that the sustainable benefits should outweigh the increase in flood risk and that the new development is both resilient and resistant to flooding. Additionally, legislation such as the Flood and Water Management Act (2010) provides the framework for flood management and seeks to create a system of guidance regarding managing development in floodplains.

Figure 5. Homes better protected in high-risk districts
2016-2020



Source: National Audit Office

Since 2019, the government has published a National Policy Statement on flood and coastal erosion risk management, alongside the Environment Agency's national Flood and Coastal Erosion Risk Management (FCERM) strategy and Action Plan (2021), both of which aim to ensure resilience in England towards flooding and coastal erosion. The Policy Statement sets out a long-term approach to commit to making better decisions about the actions and investments taken which account for future risks in a changing climate. The FCERM strategy, as a requirement of the Flood and Water Management Act (2010), provides a framework to guide the operational activities and decision-making of practitioners, in support of the direction set by the Policy Statement and the 25 Year Environment Plan.

The FCERM strategy seeks to invest £5.2bn in flood schemes over the next six years, with over £860m expected to support flood alleviation schemes this year⁶¹. Broadly welcomed, the Flood and Coastal Erosion Investment Plan (FCERM) will benefit over 1,000 schemes across England and hopes to better protect 336,000 properties by 2027, helping to avoid £32bn in wider economic damages and reducing the national flood risk by up to 11 percent⁶². This investment follows the Environment Agency's delivery of the government's previous £2.6bn investment between 2015 and 2021, which better protected more than 314,000 homes. This year will see an extra £250m spent on flood and coastal defences compared to the previous year, the highest ever annual investment in flood protection in England.

The plan focuses on five policy areas:

1. Upgrading and expanding national flood defences and infrastructure
2. Managing the flow of water more effectively
3. Harnessing the power of nature to reduce flood and coastal erosion risk
4. Better preparing communities through planning reforms, insurance provision and a resilience roadmap
5. Enabling more resilient places through a catchment-based approach

The moves were broadly welcomed and provided a "positive message for communities" but some experts said maintenance budgets for flood defences would also need to rise and that local authorities still needed more resources⁶³. Neil Parish MP, the chair of the House of Commons Environment, Food and Rural Affairs Select Committee, said: "The new investment plan is a welcome step toward greater flood resilience as we adjust our homes and our lives to cope with the changing climate. However [the investment in defences] must be matched by a long-term budget for maintenance." He said local authorities also needed the resources to factor the impacts of the climate crisis into development decisions. This is the crux of the matter - with councils in England facing an overall funding gap of £8bn by 2025, it is vital that any new activity arising from the strategy is resourced⁶⁴.

61 Defra (2020) – Flood and coastal erosion risk management: policy statement

62 Ibid.

63 Carrington, The Guardian (2021) – Record funding for flood defences in England as climate crises worsens risks

64 LGA (2019) – LGA response to draft FCERM Strategy for England

For the FCERM plan, while the ambition is for councils to continue to work with partners to create climate resilience places, they are not able to absorb the level of additional activity that the strategy proposes without significant additional investment. Councils are already under-resourced, and the strategy measures could exacerbate existing pressures unless sufficient additional resources are provided or unlocked by joining up flood risk, water resource management and growth agendas. Positively, the strategy recognises that the tools needed to deliver resilience will vary from place to place, that there is not a 'one size fits all' approach and is best designed at local rather than national level. Yet, at the same time, the strategy assumes that the present funding model will continue in its current format which allocates funding on a prioritised basis according to national outcome measures and does not lend itself to delivering flexible local place-based solutions. There is a need to look at existing funding mechanisms for funding flood and coastal resilience to establish whether they are suitable and supportive of a resilience-focused flooding and coastal change agenda.

Regarding flooding and resilience, the National Planning Policy Framework provided a set of guidance in relation to floodplain development. It stated that "inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere"⁶⁵. This highlighted the key goal of avoiding developments that could suffer from flood risk, should they be made in areas designated as being inappropriate due to the natural hazard. However, it also stated that developments could be made so long as safety measures were taken in case of flooding.

Flood defences under private ownership

Although flood defences are crucial public assets, and the Environment Agency has the primary responsibility in flood and coastal defence, under civil law individual property owners own and are responsible for any flood defences on their land⁶⁶. A third of flood defences in England are privately owned. These defences range from flood walls or embankments to weirs and piers, to outfall pipes and culverts running underneath roads, railways or other property.

If maintained, privately owned flood defences pose no issue. Yet, an October 2021 investigation by Unerthed found that more than a thousand

65 MHCLG (2021) – National Planning Policy Framework

66 UKELA, Law and Your Environment (n.d.) – Top Legal Questions

privately owned flood defences in vulnerable parts of England were in a poor condition in 2020 and are twice as likely to be in a poor condition as those maintained by the Environment Agency⁶⁷.

The Environment Agency rated privately maintained flood defences across London, and all data refers to 'high consequence' locations - where defences are protecting areas 'where the consequence on people and property' is high, should a defence fail. More than a hundred of London's privately owned flood defences were rated as either 'poor' or 'very poor' by the EA during its 2019/2020 report. With roughly 10 percent of the entire country's poorly rated flood defences in London, this is a cause for concern⁶⁸.

The problems with private ownership are clear:

1. Private owners cannot be forced to maintain upgrades to defences. Local authorities can only 'ask nicely' when contacting private owners.
2. Upgrades can be very expensive and thus deliberately ignored, risking performance failure. Additionally, new funding for new flood and coastal management schemes are not available to private defence owners, who must pay for repairs out of their own pockets⁶⁹.
3. There is no public record of ownership or maintenance of private flood defences in England, and so often local authorities have no idea who owns them in their own towns and cities⁷⁰. This becomes a big issue if these defences are rated poor or very poor.

This status quo undermines the Environment Agency FCERM plans to improve England's flood defences, potentially contributing to a deterioration in managing flood risk across the country. Further government action may need to be considered surrounding the inspection and maintenance of private defence ownership to protect the public from increasing flood risk.

67 Pidd & Sandler Clark, *The Guardian* (2021) – Revealed: a third of England's vital flood defences are in private hands

68 Thomas, *Timeout* (2021) – Over a hundred of London's private flood defences are rated 'poor' or 'very poor' by the Environment Agency

69 *Ibid.*

70 Sandler Clark, *Unearthed* (2021) – Over 1,000 private flood defences in vulnerable parts of England were in poor condition last year

2.2.1 Flooding in the Spending Review

The Autumn Budget and Spending Review presented in October 2021 provided new government grant funding for councils over the next three years to support vital service, including flood management.

To reduce the likelihood and impact of flooding, the government has reaffirmed doubling of investments in the FCERM programme to £5.2bn. The Chancellor also announced an additional £27m to support flooding incident and emergency response activities and an additional £22m each year for the maintenance of flood defences.

Local governments and insurers alike have been pleased by the commitment of additional investment each year but recognise the need to work closely with government to understand how the additional funding will be spent and ensure that local authorities are able to access the funding⁷¹⁷².

Additionally, aware of the significant damage it can cause, the government will commission the NIC to report on effective management of surface water flooding in England through improvements to drainage systems in both urban and rural areas.

2.3 Problems with the current system

2.3.1 Relaxation of planning rules

David Crichton, in his book *Floodplain Speaking* (2012), reported that floodplain development had become easier through a succession of planning policies and that flood defence spending had been reduced. In 2011, the coalition government relaxed planning rules, and despite repeated warnings of increased severe flooding, government action has been piecemeal⁷³. Since then, local planning authorities no longer had to report cases where they ignored EA advice and it has also become easier for them to approve planning applications in high-risk areas.

While national planning policy in England should steer development away from current flood risk areas and advises that future risk should be considered, at present there is no clear policy for how local authorities should effectively account for the flood risk associated with increasing climate change in plans and development decisions. Thus, faced with competing interests and institutional agendas such as constraints on building on protected land (e.g. the green belt

71 Rosanes, *Insurance Business* (2021) – Autumn Budget 2021: Insurance industry reacts

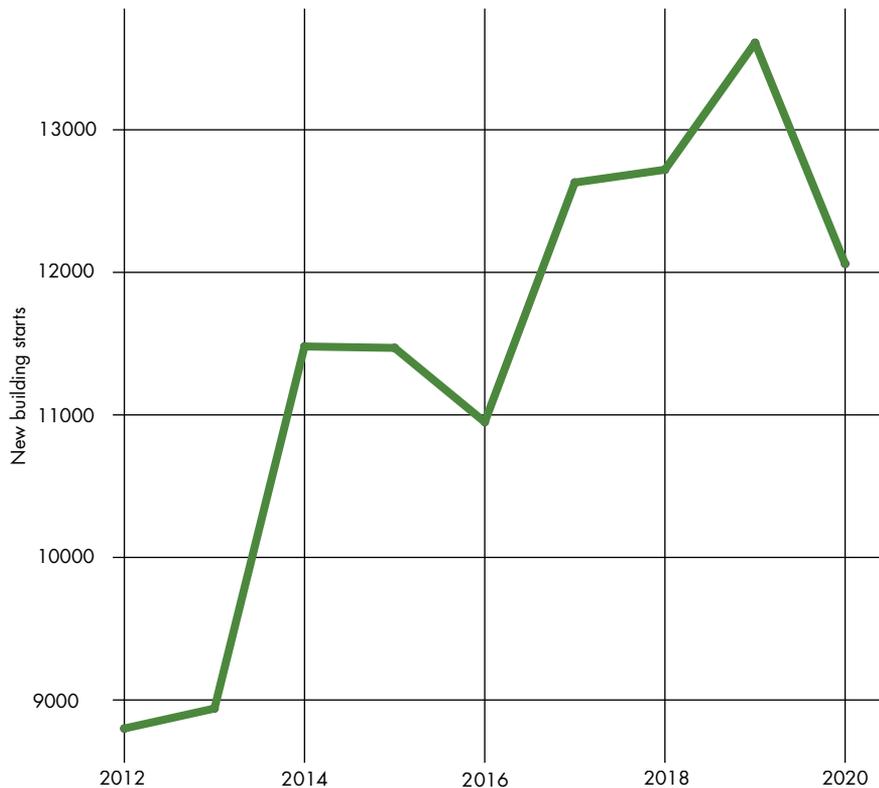
72 LGA (2021) – 2021 Autumn Budget and Spending Review: on the Day Briefing

73 Chelmi, *Groundsure, Today's Conveyancer* (2016) – Building on the flood plain

around urban areas in England) and pressure to meet national housing targets, local authorities in the UK frequently permit new developments in flood zones⁷⁴. And while the FCERM strategy was broadly welcomed, some experts declared that maintenance budgets for flood defences would need to rise, local authorities would need more resources, and there were questions around the capabilities of government to superintend the efficient public administration required to deliver the plan.

Figure 6. New building starts in high-risk districts

Planning districts in top 10% for homes at risk



Source: NAO/MHCLG

74 Rözer & Surminski, Grantham Research Institute on Climate Change and the Environment (2020) – New homes, flood resilience and environmental justice – current and future trends under climate change across England and Wales

2.3.2 Central-local complexity

There is a huge mismatch between central and local relations regarding flood risk management affecting the entire journey from local plan to development control. This has led to data gaps, a lack of ambition and a subsequent lack of effective action and change.

Complexity is borne from the multitude of bodies involved in flood risk and service management. In the UK, the local authority is responsible for housing, with the county council (if it is a two-tier authority) responsible for statutory consultee for surface water drainage. Meanwhile, the EA is responsible for flood risk and a private water company is responsible for drainage. When there is an emergency, these roles are slightly different and don't align in the same manner. The district council is responsible for evacuation, with the county council focusing on providing alternate accommodation.

In contrast, the Netherlands is vastly simpler. A municipality is responsible for all these aspects – housing delivery; highways; drainage; local watercourses; a utility provision. This streamlined approach, while not perfect, is simpler and easier to understand especially for communities and those affected by flooding. In the UK, the sheer complexity of organisations, their changing roles in an emergency and subsequent lack of alignment is an issue. Additionally, at the macro central government level, the planning reforms are being led by DLUHC, but flood risk management is led by Defra which presents a clear disconnect and need for greater coordination at a central government level for planning reforms and future development. It is not just an alignment of processes that are required. Flood risk management also needs alignment of ambition, reporting mechanisms and accountability. Currently, none of this exists. Without it, driving change is near impossible at any level.

Somerset Flooding 2013-2014

In December 2013, a spate of severe storms hit the UK with further heavy rain and strong winds continuing throughout the Christmas period and into the New Year. This resulted not only in record levels of rainfall in Somerset and long-term flooding, but also revealed the pressures of flood risk management felt by both local and national government as a public 'blame game' commenced.

Between December 2013 and March 2014, record levels of rainfall fell in Somerset. This resulted in extensive flash and fluvial flooding that severely impacted the Somerset Levels and Moors (SLM). The heavy rainfall led to

extensive flooding with over 600 houses and 17,000 acres of agricultural land affected. Flood relief activities included the use of rescue boats and the army. High volume pumps were brought in from the Netherlands and installed at several points to try to relieve the flooding. Controversy arose about the role of the Environment Agency (EA). Better farming and development practices, and some drainage works, were recommended to reduce flood risks in the area.

It is worth noting that, in 2011, within Sedgemoor District, there were 5,400 properties in significant flood risk areas, 11 percent of the total. Furthermore, almost 900 of these high-risk properties had been built since 2011, at a rate of development nearly three times higher than lower-risk areas of the Levels⁷⁵.

Whilst certain moors flood annually, the winter flooding saw not only the flooding of most of the moors on the SLM but also adjoining roads and properties. The flooding remained for up to three months in some locations. The flooding caused damage to properties, agricultural land, infrastructure, and the environment. It also closed 81 road closures across Somerset, some of which remained closed for three months, severely impacting residents, commuters, and businesses. Economically, across the country the worst affected areas were Somerset, Devon, Dorset, and Cornwall with direct, indirect, and strategic economic impacts caused by the unprecedented levels of flooding that occurred. The flooding cost the Somerset economy between £82.4m and £147.5m⁷⁶.

Somerset was flooded for about five weeks before the issues began to rise in the media and political agenda⁷⁷. When Prime Minister David Cameron finally confronted the tempest face-on, he channelled a Churchillian blitz spirit: "It will be a long haul and it will require a stepped up national effort, with the whole country pulling together⁷⁸. Amidst all of this, as is so often the case, in the toughest of times we are seeing the best of Britain." In testament to the scale of the political crisis, Cameron deployed the last-resort weapon - a blank cheque: "Money is no object in this relief effort." The government announced a national multi-million-pound support package totalling more than £560m to overcome the immediate and longer term recovery issues

75 CCC (2014) – Long-term flood resilience plan for Somerset Levels and Moors /

76 Somerset Rivers Authority (2015) – Somerset Economic Impact Assessment of the Winter 2013/14 Flooding

77 Carrington & Morris, The Guardian (2014) – Flood simple: the UK flooding crisis explained

78 Wintour & Booth, The Guardian (2014) – UK floods: David Cameron pledges unlimited public funds

faced by local authorities, communities and businesses, and to repair road and flood defence infrastructure, supported by a newly established Ministerial Recovery Group⁷⁹. As a result of the unique nature of the flooding experienced across the SLM, a range of local and national organisations with the involvement of the local community developed *The Somerset Levels and Moors Flood Action Plan* to guide water and land management policies and investment on Somerset's Levels and Moors for the next twenty years⁸⁰.

The flooding on Somerset levels took a bizarre turn, as a blame game commenced between local MPs and national government bodies. Somerset MP Ian Liddell Grainger labelled the bosses of the EA, which delivers the nation's flood defences, "bush hookers" and its chairman a "git", as an argument about lack of dredging ensued⁸¹. Sniping between cabinet ministers descended into accusations of "grandstanding" and being "stupid"⁸². The EA - whose budget had been slashed and was losing 25 percent of its staff, including frontline personnel - was scapegoated⁸³. At the beginning of February, the Environment Secretary handed over the flood management to Eric Pickles, Communities Secretary. Pickles apologised "unreservedly" for not dredging the SLM and said that "the government may have relied too much on the advice" of the EA⁸⁴. The head of the EA, Lord Chris Smith subsequently responded by openly rejecting the criticism of his organisation saying that government budget cuts and "value-for-money" rules imposed by the Treasury were responsible for limiting the EA's response⁸⁵. The media subsequently reported that the Environment Secretary had protested in the strongest possible terms to the Prime Minister about the Communities Secretary "grandstanding"⁸⁶. Cameron stamped out the blame game just as the flood crisis reached the nation's most famous river, the Thames, whose floodplain snakes through the prosperous south-east, a

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- 79 Cabinet Office (2011) – List of lead government departments' responsibilities for planning, response, and recovery from emergencies
- 80 Somerset Rivers Authority (2014) – The Somerset Levels and Moors Flood Action Plan
- 81 Moss & Glaze, *The Mirror* (2014) – Tory MP Ian Liddell-Grainger blasted for 'hooker' slur at flood fight bosses
- 82 Chorley, *Daily Mail* (2014) – Cameron tries to get flood rescue effort back on track as he orders squabbling ministers to 'get on with their jobs'
- 83 Carrington, *The Guardian* (2014) – Floods: Environment Agency frontline staff hit by cuts, whistleblowers reveal
- 84 BBC (2014) – UK floods: Government 'made a mistake' by not dredging
- 85 Carrington (2014) – Ministers playing politics with floods, says Environment Agency chief
- 86 Morris, *The Independent* (2014) – UK weather: Eric Pickles and Owen Paterson clash over the performance of the Environment Agency

Conservative heartland⁸⁷.

The floods exposed the lack of alignment and collaboration between local and national government exacerbated by funding cuts at all levels.

2.3.3 Skills deficit

The Town and Country Planning Association (TCPA) have surveyed local authority planning capabilities to assess the degree to which local authorities are incorporating the future impacts of climate change into their planning process. The main finding was that local authorities report a skills and capabilities deficit, notably for flood risk and on climate change. Just 12 percent of local authorities strongly agree that they have the skills and expertise to take account of flood risk now and in the future in planning decisions⁸⁸. Despite over 60 percent of councils declaring climate emergencies, local authorities have a critical shortage of skills and expertise in relation to planning for climate change. For example, only 2 percent of local authorities are considering future insurance availability and affordability when making planning decisions, and only a third of local authorities are seriously considering the impacts of climate change when deciding whether to grant planning permission.

The EA offer a variety of entry-level schemes including a graduate programme and foundation degree in flood and coastal engineering that include skills in planning⁸⁹. This, however, is not sufficient to close the skills gap in the profession, ever-increasing by lack of resources, recruitment, and desire to enter into the sector. A wider approach to training professionals in a variety of disciplines around the management of flooding and climate resilience is necessary as climate risks and extreme weather intensifies.

Over recent years, as has happened for many local authority departments, the planning departments have been merged and diminished as local government funding and investment has been cut. There is a dearth of skills amongst planners across the board who are specialists in the complexities of planning but lack the knowledge to make decisions on the unfamiliar topics of flood risk and climate change. Thus, they are entirely reliant on the contributions of consultees such as county councils, LLFAs and the EA to avoid poorly informed planning decisions. For surface water flooding,

87 Ibid.78

88 Feith, TCPA (2020) – Loss of skills and power: is local government critically unprepared for the climate crisis?

89 EA (n.d.) – Working for EA

a growing area of risk, the skills deficit is compounded by the lack of understanding and technology in detecting such flooding. As local decision-makers, it is paramount that the local authority planning departments are better resourced to deal with the flood risk challenges they are facing now and into the future.

2.4 Role of insurance

As a financial institution, insurers are heavily involved in flooding and flood risk, which is why the government and insurers developed a new system of re-insurance, Flood Re⁹⁰. Flood Re promotes the availability and affordability of flood insurance to those who own and live in properties in flood risk areas⁹¹. Although owners of properties at risk may pay more, Flood Re works to limit levels of premiums and excesses through a system of re-insurance, in which companies take out further levels of insurance to curb their exposure.

Flood Re has undoubtedly been a success. Since the start of the scheme, 300,000 people have access to flood insurance where they didn't previously, and 100 percent of people involved have access to quotes that didn't before. To avoid the scheme incentivising the building of homes on high flood risk land, houses that were built after 2009 are not covered by the scheme⁹². Despite this, due to developer pressure housing has continued to be built on these high flood risk areas with at least new 5000 dwellings approved by local authorities on floodplain land so far this year.

Important work by Flood Re and others has been done to encourage homeowners to put property flood resilience in place, such as a Code of Practice and Certification Scheme⁹³. However, the Committee on Climate Change 2019 progress report recognised that there were no clear plans for targets for large-scale implementation and property flood resilience plans did not consider interventions in the context of climate changes of any magnitude⁹⁴.

According to the 2020 'Bricks and Water' inquiry, Policy Connect and Westminster Sustainable Business Forum recommended that "given the limited uptake of property flood resilience measures and continued development within the floodplain, government should either extend the Flood Re scheme to include residential buildings constructed after January 1st 2009, or put in place an alternative scheme⁹⁵.

90 House of Commons Library (2019) – How do insurers deal with flooding and flood risk?

91 Flood Re (n.d.) – How Flood Re works

92 Gray, Financial Times (2013) – Ministers agree UK flood insurance deal

93 Flood Re (n.d.) – Flood Re Briefing

94 CCC (2019) – Reducing UK emissions: 2019 Progress Report to Parliament

95 Allen, Policy Connect (2020) – Bricks & Water: Building Resilience for England's Homes

There is no available national data that allows a thorough assessment of the proportion of homes or businesses that have insurance to cover flood risk. The 2020 Blanc review undertaken in Doncaster following the devastation of flooding in November 2019 was one of the first opportunities to look at the adequacy of Flood Re insurance scheme in practice since the establishment of the scheme⁹⁶. It became apparent that several households and businesses affected by the 2019 floods were poorly protected by insurance, despite the introduction of Flood Re in 2016 which should, at least for eligible households, have removed most of the barriers to securing insurance coverage for flood damage. The review found sizeable differences between owner-occupiers and tenants with more tenants being poorly protected. Yet, even 28 percent of owner-occupiers were not covered⁹⁷. If echoed across the country, this could mean tens of thousands of vulnerable households are unnecessarily unprotected against flooding and failing to access the support set up to help them.

Yorkshire Dales Flooding 2019

In November 2019, a slow-moving front brought months worth of persistent heavy rainfall in a 24-hour deluge over parts of Lincolnshire, Nottinghamshire, Derbyshire and South Yorkshire⁹⁸. This event followed heavy rain affecting a swathe from Wales, through Shropshire to South Yorkshire at the end of October and generally unsettled and wet weather from late September onwards. The result was that already full rivers overtopped their banks and flooded low-lying areas⁹⁹.

The EA stated on 8 November that there were six severe flood warnings in South Yorkshire with a threat to life, 75 flood warnings and 103 flood alerts¹⁰⁰. Residents were critical of the EA which had stated that on 8 November at 5:00pm there was no flood warning¹⁰¹. Even when the village had flooded by 9:00pm, the EA has still not issued a flood warning. In an update on 14 November, the agency stated that 38 pumps had been set up across South Yorkshire, including at eight separate locations in the Fishlake area, which had helped to reduce water levels in the village from 2 metres

96 Blanc (2020) – Independent Review of Flood Insurance in Doncaster

97 CCC (2021) – Progress in adapting to climate change: 2021 Report to Parliament

98 Met Office (2019) – Severe flooding South Yorkshire

99 Defra & Rural Payments Agency (2020) – Agricultural Land flooded in November 2019

100 EA (2019) – Press release: Environment Agency working day and night to reduce flood impact

101 Walawalkar, The Guardian (2019) – ‘We can’t go’: Fishlake residents defy flood waters and authorities

to 0.3 metres. The Met Office's review of the year (published 23 December) stated that South Yorkshire, Nottinghamshire and Lincolnshire broke autumn rainfall records in 2019, with a wet summer meaning that rain was falling on already wet ground¹⁰².

Homes were evacuated, transport disrupted, and life was lost. In some places, pumps were installed to reduce water levels and the military was called in to assist. On 14 November, the EA estimated that 830 properties had been flooded. This figure was challenged by *The Guardian*, which had contacted local authorities in Yorkshire, Derbyshire, Nottinghamshire and Lincolnshire, and found that at least 1,758 properties had been flooded¹⁰³. The worst effects of the floods were felt in Doncaster where 970 properties were affected and more than 1,200 people were evacuated¹⁰⁴. South Yorkshire's Community Foundation said on the web page for its flood disaster relief appeal that over 1,000 households had been affected¹⁰⁵. The government¹⁰⁶ made several announcements of support for those affected, including activating the Bellwin Scheme, the Flood Recovery Framework and the Property Flood Resilience Scheme.

Parliament was not sitting when the flooding began on 8 November having been dissolved two days previously. The initial reactions to the severe weather events, therefore, played out against the backdrop of the general election campaign. Labour and Liberal Democrat parties called on the government to declare a national emergency and local government criticised the levels of investment in flood risk management. When Parliament returned, several debates were held in relation to the floods, while issues including insurance and planning received renewed attention.

The bottom line is that this flooding event would always have been devastating, simply due to the high levels of rainfall. However, it was made worse by poor land management, building on floodplains, and the reduced funding for local councils to effectively mitigate such events.

One thing that insurers repeatedly see when there has been a flood event followed by an allocation of maintenance grants is that the speed and the system

102 Met Office Press Office (2019) – 2019: A year in review

103 Halliday & Pidd (2019) – Council leaders demand huge funding rise after floods

104 Ibid.

105 South Yorkshire's Community Foundation (n.d.) – SYCF Flood Relief Fund Grants for Community Groups

106 Finlay, House of Commons Library (2020) – Briefing Paper: Autumn and winter floods 2019-20

of getting them from central government to local authorities and then to the people affected by flooding can often be slow, rife with confusion from residents. Homeowners understandably want to get the repair process underway as soon as possible and when that money is going to be available. Yet, with the complexity of available grants, obtaining one isn't aligned to the repair process and deters residents from even applying due to a lack of understanding. Despite the role of insurers to support them and provide information to a degree, the complexity serves to create barriers in improving flood risk.

In addition to a paucity of flood coverage and claims, these gaps in insurance coverage result in inconsistencies with achieving an increase in the uptake of property flood resilience. The current regulations that are the bedrock of the scheme are preventing Flood Re from creating tangible property flood resilience incentives, such as offering discounted premiums to households that have fitted property flood resilience measures. The government intends on introducing changes to the Flood Re Scheme to increase the uptake of such resilience via legislation.

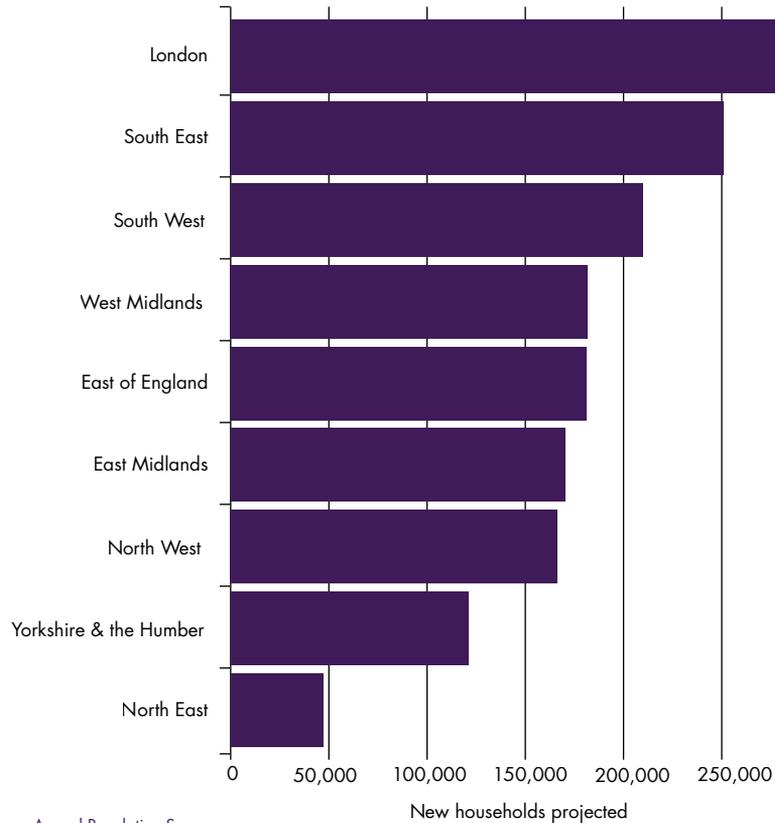
CHAPTER THREE

Living with flooding

As an island nation situated where several major weather patterns meet – including the increasingly erratic Gulf Stream – there’s a four-sided problem facing the UK¹⁰⁷. Firstly, to meet the UK’s growing housing needs we have little choice but to build on flood-prone development sites.

Secondly, however, major storms that saturate the ground are increasing the volume of rainwater run-off to swollen rivers and waterways. Thirdly, we know that climate change will lead to average sea level rises this century of close to two metres. And finally, this will increase coastal and estuary flooding, force rivers back onto floodplains, pushing water further inland where it will have nowhere to go other than into homes and commercial properties.

Figure 7. Household growth in England's regions
2021-2031, projection



With a gradual shift of the responsibility towards private households and businesses to manage their own flood risk over the last decades, the question of uneven distribution in the capacity of communities, neighbourhoods, and individuals to respond to and recover from flooding is emerging. Flood risks consist of two elements: the hazard, in the form of peak discharges; and the consequences, the resulting damage and social disruption¹⁰⁸. In determining effective strategies, decision-makers need to look at enhancing the resistance of the system, the resilience or consider refraining from development on floodplains entirely.

It must be remembered that there are local factors to be considered when assessing flood risk management strategies and house building. For certain areas, such as South Holland where 34 percent of the district's land is at high risk of flooding, building on floodplains is necessary to meet housing demand. In comparison, areas such as Calderdale and West Devon with a lower risk of flooding have greater choice to opt-out of building on floodplains to build somewhere more sustainable. Thus, there cannot be a universal rule to building on floodplains but is in fact on a sliding scale. The approach decided upon should include a range of factors such as level of flood risk, percentage of land within the flood risk, and housing demand. Where building on floodplains cannot be avoided due to such factors, appropriate defences should be built into and alongside both the individual development and associated neighbouring infrastructure. This will be unique to place and will change over time but should always be assessed with the ambition of building the most sustainable, resilient properties.

3.1 Resistance: the preventative approach

The traditional strategies in developed countries, focusing mainly on the hazard of flood risk by aiming at flood prevention, can be considered resistance strategies¹⁰⁹. Resistance measures are installed to prevent floodwater from reaching or entering a property. Permanent options are normally in the form of walls that surround properties or communities or are additions to the fabric of the building, while temporary options are typically designed to cover building apertures. Resistance measures can prevent water from getting into a property or can give more time to the householder to move valuable possessions or evacuate. Therefore, they can avoid many damages caused by flooding, which have a cost range of £10,000 – £50,000 depending on the flood depth.

Data deficit

A major gap in understanding flood resilience is the lack of an empirically validated measure of it and thus a lack of evidence.

Although there have been around 23,000 publicly funded installations of property flood resilience (PFR) since 2008, there is no central database of the locations or what measures were installed¹¹⁰. Equally, limited data

109 Ibid.

110 Defra (2021) – Call for evidence: Local factors in managing flood and coastal erosion risk and property flood resilience

has been collected on the financial benefits of reduced damages for those properties. Consequently, there is limited evidence about the performance of these schemes, whether householders know how to deploy them or whether they still have structural integrity¹¹¹. The lack of information about the performance of measures and reduction in expected damages makes it difficult to confidently promote PFR creating challenges when trying to encourage customers of the benefits and when developing a product or building standards. Additionally, a scarcity of evidence has presented difficulties in pricing PFR into insurance policies and premiums.

Collating this information is challenging for several reasons¹¹². For example, data about which properties have PFR fitted does not go through one central organisation as installation of PFR can be incentivised through a range of mechanisms e.g., government recovery funds, insurance funding of Build Back Better, government grant in aid, individuals funding it independently. And the information recorded could focus on a variety of things: whether the property has PFR or not, the amount spent, the specific measures installed. This makes obtaining a clear and accurate picture of PFR from these multiple players tricky. To compound this complex situation, there are also potential data protection barriers arising from collecting and sharing consumer data, as well as commercial sensitivity. Finally, there is also the fact that some PFR data might simply not have been recorded.

A more scrupulous way of recording which properties are flood resilient, to what degree, how maintained and how effective the resilience measures are is needed and needs to be readily available to insurers and relevant stakeholders.

Resistance strategies involve uncertainties by assessing and including them in the flood probability while over-dimensioning flood prevention structures. There are many floodplains that are currently defended, providing a level of protection that might enable appropriate housing developments. And in this situation particularly, flood defences prove that they are critical in defending people's homes. However, with increasingly heavy rains and rising sea levels due to climate change, as EA Chair, Emma Howard Boyd points out: "we cannot win a war against water by building higher flood defences". The EA's latest report emphasized how the

111 McClymont et al. (2019) – Flood resilience: a systematic review

112 Waterman et al. (2021) – A Mixed-Methods Investigation into Barriers for Sharing Geospatial and Resilience Flood Data in the UK

Agency alone cannot protect everyone from increasing flood and coastal risks, and traditional flood defences will not be able to prevent all flooding and coastal erosion¹¹³. As a stand-alone measure, in the face of climate change, they have limitations.

Firstly, there is the expectation that flood defences are a final and enduring option, and thus developments behind them will always be protected. In fact, they do have a shelf life and will not be there in perpetuity, requiring replacement after around 40 years. Not only will they require replacement, but also regular maintenance which comes at an ongoing cost to the UK taxpayer. However, the ABI worked with Flood Re to show that for every £1 spent on flood maintenance spending to existing flood defences, £7 will be saved on capital defence spending¹¹⁴¹¹⁵. But in 2020, there were reductions in revenue allocation on the maintenance of flood risk assets. Currently, insufficient funding is being allocated to maintain these flood defences. A second issue is the false sense of security flood and coastal defences provide. This leads to inappropriate development behind such defences which statistically will be significantly overtopped because of climate change. Finally, building bigger flood and coastal defences are not enough of a protection strategy without appropriate flood risk awareness. The EA finds that more than 5m people in England are at flooding or coastal erosion risk, but only a third living in flood risk areas know this. This leaves communities vulnerable and unsuspecting of the true flood disaster risk.

3.2 Resilience: the holistic approach

Resilience strategies focus on living with floods instead of preventing them, relying on a flexible response to floods and a rapid recovery from them¹¹⁶. The FCERM strategy defines resilience as “the capacity of people and places to plan for, better protect, respond to, and recover from flooding and coastal change¹¹⁷. This includes making the best land use and development choices, protecting people and places, responding to, and recovering from flooding and coastal change whilst all the time adapting to climate change.” Resilience is a holistic approach to flood risk management, focusing on the balance between the socio-economic situation, the physical situation, and the climatic variability. There are three key aspects to resilient flood risk management: risk acceptance; a bespoke melange of

113 The Guardian (2021) – ‘Adapt or die’: resilience to climate change needed, says Environment Agency

114 Environment Agency (2020) – National Flood and Coastal Erosion Risk Management Strategy for England

115 ABI (2021) – Modelling the impact of spending on defence maintenance on flood losses

116 Ibid.110

117 Ibid.116

both resilient and resistant flood defences; and an holistic approach to include the entire social infrastructure.

Flood risk management is an issue of risk, balancing which risks are acceptable to take. Resilience involves accepting that with climate change, even with resistance and resilience measures to flooding, repeated flooding will be experienced as areas increase in flood risk. Flood risk varies depending on place, therefore when it comes to developing in areas that are nominally the floodplain, the risks of doing so might be satisfactory. However, this is something that needs to be understood as housing demand and provision continues to grow.

The holistic combination of all available flood defences, both structural and social, resistant and resilient, is resilience. In flood risk management, the probability, water level and pattern of floods plus the behaviour of people are uncertain. Resistance strategies alone can manage these uncertainties to a point by building bigger flood prevention structures. But as we have already pointed out, this is time limited as climate change intensifies. Resilience strategies are designed explicitly with uncertainty in mind and are designed for the whole possible flood range. In this vein, flood defences that focus on the social fabric of flood risk areas need to be incorporated alongside structural resistant strategies.

Communities need to understand their risk to flooding and coastal change, know their responsibilities and how to act. To do this, people need to be educated and inspired to act pre-emptively, before flooding or coastal change happens. Across England, we are steadily becoming more attentive to the increasing risks from flooding and coastal change. It is estimated that over 5.2 million homes and businesses in England are at risk from flooding and coastal erosion¹¹⁸. However, in 2019, only 39 percent of those with properties in areas classified by the Environment Agency as being at risk, actually believed their property was either 'definitely' or 'probably' at risk.

Risk management authorities need to communicate the risks and consequences of flooding and coastal change more effectively and to a much wider audience than is currently the case, especially with areas at risk of flooding increasing with climate change. Capitalising on technological and digital advances would achieve much towards more effective use and circulation of the information that risk management authorities already have and by conveying it in an understandable way. Community groups, such as local flood action groups, also have a key role in communicating risk and promoting shared ownership

118 Ibid.116

with risk management authorities of the actions local people need to take. All flood defence options are valuable but each option is only feasible and effective if in combination with others, incorporating a mix of both social and structural strategies; the combination of which should be bespoke for the hyperlocal, to ensure the most effective and inclusive flood risk management.

Flood resilience works on multiple scales, and to 'Build Back Better', it must be remembered that a flood resilient building is only the beginning. While flood resilience is by design - reducing exposure and vulnerability of existing and new buildings to flooding through sustainable materials, use of flood walls, elevation, dry and wet floodproofing – the wider impact also needs to be considered. Whilst a flood resilient home stays dry inside, if it is surrounded by water then it is still a problem and not a viable home during flooding events. Many more people are continually affected when essential transport services, energy and water infrastructure are interrupted, or schools and workplaces are damaged by flooding or coastal change.

For every household directly affected during a large flood, about 16 people suffer knock-on effects from losses of utility services¹¹⁹. Surface water flooding is also a key culprit in this as new infrastructure prevents water from draining away and can overburden existing drainage systems. Thus, resilience isn't simply about staying dry but about considering protection and recovery of surrounding service provision and infrastructure of a development to keep it tenable as a dwelling. If in the future we are going to need to continue building on the floodplain, going forward it is just as much about the location of new developments, and surrounding infrastructure as it is about the build and the design of a development.

Vitaly important in the immediate, resilience is also integral into the future. Many homes aren't at flood risk now but will be and must be considered in planning and flood risk management. During the summer of 2021, homes in London were flooded for the first time that, in the past, would never have been considered likely to flood. Resilience, planning and flood risk management need to consider emergent areas of flood risk. Houses currently being built outside of the floodplain need to be resilient to future flooding.

Progress towards resilience is already being made as flooding and coastal change is recognised as a key impact of climate change. There are many individuals and organisations providing leadership and helping to champion better communication and management of the risks from flooding and coastal

change. The new FCERM strategy has several commitments for the EA to improve resilience to flood risk and encourage long-term adaptive planning while local resilience forums (LRFs) are beginning to develop response and recovery plans for flooding based on present-day risk, while including climate change in local plans and risk registers. Additionally, new guidance was published by EA for planners to account for future climate change allowances and risks. This ensures they are better prepared for river and coastal flooding.

Resilience has a role to play but it isn't the silver bullet, and you can only go so far with such strategies. It takes time to implement and currently, a greater evidence base is needed for the right resilience measures to be implemented. For it to be effective it must be ingrained in every member of the public of the UK.

3.3 Refrain: the idealistic approach

The Public Accounts Committee says it makes no sense to keep allowing houses on floodplains where climate change means the risk of flooding is continually on the rise¹²⁰. The MPs advocate for legislation to change planning policy and halt building in areas vulnerable to flooding after warning of gaps in flooding risk protection and funding concerns. They argue that the government is not intervening to prevent new homes from being built on floodplains and that more needs to be done to combat the exorbitant home insurance costs that result. While government policy is not to build on floodplains unless unavoidable, there could still be a large increase in the number of houses built on flood plains over the next 50 years¹²¹. Despite this, the fact remains that we live on an island with limited capacity to meet the growing housing demands. Is opting out of building on floodplains in the future the most realistic and practical option?

3.4 Going forward

Resilience needs to be the priority, utilising all the tools and strategies at our disposal to protect and promote communities at risk. It doesn't sit alone, however. Resilience and adaptation are indissociable. The former exists in the present but also in the future. With potentially 2 metres of sea level rise by the end of the century, some of our places in England will have markedly different environments in the future. Taking resilience both now and in the future and incorporating it into planning strategies and flood risk management ensures adaptability and survival in the face of climate change.

120 Kelly, Construction News (2021) – Flood protection is the 'next major building scandal', MPs warn

121 Public Accounts Committee (2021) – Managing flood risk

Imminent tests are coming up for flood risk management, specifically around the planning reforms and the call to 'build back better'. The planning reforms could be seen as an opportunity to strengthen flood risk planning policy, not weaken it. However, flood risk adaptation does not have a strong enough presence at the moment. Advisory bodies such as the EA can only provide guidance on what exists; if there isn't a supportive planning policy then flood risk adaptation will remain ephemeral. Currently the country is in a period where the focus is understandably on building and recharging the economy. Yet equal focus must be placed on good adaptation, placemaking and 'building back better'. There is a trade off here with investment in every aspect - projects, skills, capabilities - required for adaptation and resilience. The planning system - along with how new resources announced at the 2021 spending review are allocated - will ultimately influence the framework for flood resilience and adaptation going forward into the foreseeable future.

Recommendations

- **Planning reforms**

- Floodplain development should be avoided wherever possible and should be accompanied by appropriate flood defences, constructed alongside new developments, where unavoidable.
- Local authorities with planning teams should appoint a chief resilience officer who is:
 - Required to sit on local resilience forums.
 - To become a single point of contact for English local government districts on the issue in county/district areas, or in unitary authorities depending on governance systems.

- **Funding recommendations**

- Specific funding should be made available to establish a new cross-departmental task force to look at flood-risk development. A new ministerial post, between Defra and DLUHC, should be set up to oversee and provide accountability for this task force.
 - This would include provision for:
 - engagement with, and capacity training for, local authority planning teams (particularly chief resilience officers);
 - design and funding of graduate schemes for flood resilience professionals in planning, water management and other key disciplines;
 - serving as a single point of contact for central government on the issue.
- Money must be made available for upgrading maintaining flood defences (overseen by task force)
 - a blended mix of revenue allocation via the Environment Agency to local authorities and to internal drainage boards, to undertake essential work on existing flood defences going forward. This may well involve a period of just a few years where we frontload a significant amount of public money to bring our assets up to a condition that is easier to manage than on a 'little and often' basis.

- **A future risk-based approach to development**

- The insurance industry should work with the government, local authorities, developers and other key stakeholders to help inform what measures might be needed in the future to help mitigate against climate change and ensure that homes are and remain insurable.



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