National Audit Office

Report
by the Comptroller
and Auditor General

Department for Environment, Food & Rural Affairs

Managing flood risk

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Key facts

5.2m
properties are at risk of flooding

£2.6bn
capital funding for flooding and coastal erosion between 2015-16 and 2020-21

£5.6bn
new capital funding announced for flooding and coastal erosion up to the end of March 2027

728	schemes that have provided better protection for homes to date funded by the £2.6 billion programme for 2015–2021
242,000	homes better protected since April 2015 by the 728 schemes
16	of the 728 schemes account for more than 50% of the homes now better protected
52%	of the 728 schemes have been dependent on partnership funding
£2,753	average capital expenditure since 2015 for each property with an annual likelihood of flooding of at least 1%
7%	of partnership funding has come from private contributions since 2015
31%	of the proposed actions in the Department for Environment, Food & Rural Affairs' policy statement on future flood risk management do not have a measurable outcome
33%	fall in qualified civil engineers in the Environment Agency between 2013 and 2018

Summary

1 Flooding and coastal erosion put lives, livelihoods and people's well-being at risk. Flooding can impact on food production and destroy natural habitats. There are different types of flooding: river, coastal, surface water (when rainfall cannot drain away), sewer flooding and groundwater flooding (where the water table level rises above ground).

2 The Environment Agency (EA) estimates that 5.2 million homes and businesses in England are at risk of flooding and that around 700 properties are vulnerable to coastal erosion over the next 20 years. In addition, more than two-thirds of properties in England are served by infrastructure sites and networks located in (or dependent on others in) areas at risk of flooding. The Met Office's UK climate projections show more extreme weather events and sea level rises resulting from climate change. This, when combined with increased housing development, will heighten flooding and coastal erosion risks. Government set a target for EA to provide better protection for 300,000 homes through its investment from 2015 to 2021.

3 Flood and coastal erosion risks are managed through a number of interventions, ranging from early warning systems to building flood defences, and making homes and infrastructure more resilient to flooding when it happens. Flood defences can include infrastructure such as flood walls or natural flood management measures such as the restoration of floodplains and wetlands. Other important interventions include: ensuring communities can recover quickly following a flood; building more resilient homes and infrastructure; and adapting existing homes and buildings to increase their resilience.

4 The Department for Environment, Food & Rural Affairs (Defra) has the policy lead for flooding and coastal erosion. EA is responsible for taking a strategic overview of all sources of flooding and coastal erosion. It also has powers to manage the risk of flooding from main rivers, reservoirs, estuaries and the sea. Lead local flood authorities (unitary authorities or county councils) are responsible for developing and applying a strategy for local flood risk such as from surface run-off and groundwater. Other bodies with responsibility for aspects of managing flood risk include district councils, internal drainage boards, highways authorities and water and sewerage companies.

5 Regional flood and coastal committees bring together risk management authorities to ensure plans are in place to manage flood and coastal erosion risks, and that investment decisions optimise value for money.

6 In July 2020, the government issued a ministerial policy statement setting out its priority to create a more resilient nation to meet the challenges of flooding and coastal erosion. This replaced the previous statement, which was published in 2009. Alongside, EA laid its new strategy in Parliament, which was then published in September 2020. It sets out the vision for "a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100", and supersedes the previous strategy published in 2011.

7 This report evaluates whether government's approach to managing the risks of flooding and coastal erosion is achieving value for money. The report examines this in three parts:

- Part One covers whether the current risk management arrangements provide strong and effective oversight, challenge and direction.
- Part Two looks at what government has achieved in the period 2015–2021 and the extent to which it has used available funds to reduce flood and coastal erosion risks and measure progress.
- Part Three examines government's preparedness to manage and reduce flood risk when a new expanded investment programme begins in 2021.

8 The report covers flood risk management in England. It does not cover government's emergency response to flooding, issues relating to flood insurance, planning regulations or the management of coastal erosion. In addition to this report, we have produced an interactive data visualisation, which presents a range of information on flood risk management in England. Our audit approach is shown in Appendix One and the scope and all methods are described in Appendix Two.

Key findings

How flood risk management is delivered

9 There are gaps in government's understanding of public spending for flood risk management. Funding for floods comes from many sources, including government grant-in-aid, partnership funding, levy charges and contributions from other government departments. EA captures private and public funding for its own projects and Defra reports on most central government funding. The Ministry of Housing, Communities & Local Government reports on funding and expenditure by local authorities on flood risk management. However, Defra does not assess whether funding to local authorities is adequate to cover the level of flood risk individual authorities face. Local funding for flood risk management is not ring-fenced and Defra does not compare what authorities spend on flood risk management with what was allocated. Without this knowledge, government is unable to assess whether organisations, such as lead local flood authorities, have the resources they need to manage flood risk effectively. Defra has committed to reviewing local government funding to ensure it is fair and matches the needs and resources of local areas, but it has not set a date for this review (paragraphs 1.21 to 1.24 and Figures 4 and 5).

10 Defra does not do enough to challenge EA's approach and performance. Defra's role is to provide oversight and challenge to EA and it is accountable to Parliament for the successful delivery of the programme. In line with the wider Defra Group target operating model, Defra decided to reduce the scope of its assurance of EA. At quarterly review meetings with Defra, HM Treasury and the Infrastructure Projects Authority, EA presents headline information on overall progress, key issues and risks and progress on its largest 15 schemes. Defra relies on data provided by EA without carrying out any quality assurance and does not produce its own assessment of programme risk separate from EA's. Defra officials attend several of EA's boards and committees, including those which approve projects over a certain value. Defra could use these as opportunities to challenge EA on its progress and performance, but we have seen no evidence of Defra using these meetings in this way (paragraphs 1.10 to 1.12).

11 EA has to rely on a wide range of other bodies to help deliver its strategy but struggles to coordinate their activities. Responsibility for surface water flooding, which affects more properties than flooding from rivers and the sea, falls to lead local flood authorities but EA struggles to coordinate their activities and cannot compel them to provide information. EA is responsible for 71% of flood defence assets (by length), while third parties own the remaining 29%. EA needs third parties to better protect 102,000 homes to reach its target. It inspects all flood defences on main rivers including those maintained by third parties but cannot always enforce remedial works. Its local area teams are not communicating asset maintenance requirements consistently with third-party owners. Defra says it will start a review by the end of 2021 to ensure that asset owners' responsibilities are clear and that effective powers are in place to ensure that necessary inspection and maintenance is undertaken (paragraphs 1.3, 1.8, 1.9 and 1.14, and Figure 2).

12 Little progress has been made in streamlining local flood and coastal erosion risk management plans. In our 2014 report, we found there was a profusion of plans that often create duplication or cross administrative boundaries. Some of this complexity was necessary because government aimed to encourage local communities to do more to manage their own flood risk. At the time, both Defra and EA were looking to streamline the number of plans and strategies in place, but little progress has been made since. In 2019, the Committee on Climate Change highlighted the range of plans attempting to tackle different sources of flooding. Defra promises reform of local flood and coastal erosion risk planning so that every area of England will have a more strategic and comprehensive plan, but not until 2026 (paragraphs 1.18 and 1.19).

The 2015–2021 investment programme

13 EA is on track to achieve 300,000 homes better protected by March 2021 within its budget of £2.6 billion. Since 2015, more than 700 new schemes have been introduced, providing better protection for more than 242,000 homes. It has achieved this on budget and is on track to meet a 10% efficiency target for both capital and revenue spend set by HM Treasury. On average, EA has spent £2,753 since 2015 for each property with an annual likelihood of flooding of at least 1% at the start of the investment period. There are wide regional variations. Investment per property at risk in the North East was almost £6,000, more than double the national average and three times more than in the South West. EA told us it applies a system of national prioritisation to fairly distribute its investment around the country. Defra told us that the level of investment in an area depends on the number of potential schemes but we are also concerned that funding may be determined by the availability of contributions from external parties rather than the relative merits of individual schemes (paragraphs 2.4, 2.10 to 2.12, 2.23 and 2.26, and Figures 8 and 15).

14 'Homes better protected' is an easy-to-understand performance measure, but on its own it does not provide a good view of progress in tackling overall flood risk. By providing better protection for 242,000 homes, EA's investment programme has delivered valuable benefits for people, with flood risk being substantially lower for many thousands of homes in England. However, the homes better protected target also does not provide any indication of what has happened to flood risk for non-residential buildings, agricultural land and other infrastructure. It also does not take account of properties that have become less well protected over the period due to factors such as housing development, climate change and the condition of flood defence assets. EA uses its National Flood Risk Assessment to estimate the number of properties at risk of flooding each year. It estimates that there are 50,000 fewer properties with an annual likelihood of flooding of at least 1% in 2020 compared with 2016. Changes in methodology during the period mean this figure is not wholly reliable and EA does not use it as a measure of its progress, but it provides an indication of the net impact of the programme. More broadly, EA estimated that its programme would reduce flood risk by 5% in the current investment period, but it does not have a comprehensive measure of progress against this (paragraphs 2.4 to 2.8).

15 The need to adhere to strict funding cycles impacts the value for money of the programme. Rigidly applied funding periods can sometimes create risks where there is pressure to spend money or achieve targets by the end of the period. EA generally uses benefit–cost ratios to prioritise schemes but, from February 2018, started to place more focus on the homes better protected target in order to achieve the target by the end of the six-year funding period. EA told us that this change to its operational approach reduced the overall return on investment, although it estimates it will nevertheless achieve an average benefit–cost ratio across the programme of around 8:1. Despite the six-year capital funding settlement, HM Treasury expects the Defra Group as a whole to work within annual budgets, which reduces EA's flexibility in managing the programme. HM Treasury told us there is an option to request approval from HM Treasury for transfers between years, but this has not been requested for the 2015–2021 programme (paragraphs 2.6 and 2.16).

16 The winter floods of 2019-20 were a significant setback for EA, leaving thousands more properties at risk. The number of properties at risk as a result of the condition of EA structures and defences increased by 171% from 70,000 in 2018-19 to 189,000 in 2019-20 against a target of 49,000. In 2019-20, EA reported that 96.1% of its high-consequence assets (where asset failure would have a high impact on homes and businesses) were at their required condition against a target of 98%. EA has only met this target in two of the past six years. Floods in 2013-14 and 2015-16 also saw asset condition fall below target levels, which EA recovered in the following years, although the number of properties at risk due to the condition of EA defences was substantially lower at that time than in 2019-20. In the March 2020 budget, government provided additional funding of £120 million for 2020-21 to repair assets damaged in the autumn and winter floods. This is expected to deliver improvements to 610 projects across the country returning assets to their required condition. Of these, 151 have been completed so far, and 80% are expected to be completed by the end of 2020. For the remainder, EA is aiming to have measures in place to mitigate any immediate risks arising from potential floods in winter 2020-21 (paragraphs 2.15 and Figure 11).

17 The government's approach is designed to ensure deprived areas do not miss out on funding, but the proportion of funding to these areas has reduced substantially since 2014. In a recently published report, EA reported that people in more deprived areas were at a higher risk of flooding than others, particularly in coastal and rural areas, although the disparity has narrowed since 2006, when a similar analysis was conducted. From 2011, government introduced a partnership funding model, requiring many flood schemes to be part-funded from sources other than government grant-in-aid. Government provides grant-in-aid on the basis of expected outcomes, such as homes better protected, and these are funded at higher rates in deprived areas than elsewhere so that schemes in these areas are more likely to be fully funded by central government. Neither EA nor Defra monitors the level of investment in deprived areas routinely but EA reports that the proportion of all homes better protected that were in the 20% most deprived areas increased from 4% in 2011 to 29% in 2014 but then declined to 8% in 2019. Defra believes this decline to be because most of the available schemes in deprived areas have been completed, although it has not carried out any analysis to support this explanation (paragraphs 2.17, 2.21 and 2.22, and Figure 14).

18 EA has been successful in securing partnership funding, but this is almost all from the public sector. Just over half (52%) of the 728 projects that had better protected homes between April 2015 and March 2020 had been dependent on partnership funding, where local communities raise funding towards a scheme. EA estimates that it has attracted £530 million of partnership funding in the period 2015–2021, exceeding its target of £390 million and adding 20% to the total government investment during the period. However, more than 90% of this came from local authorities and other public sector bodies, with only £39 million (7%) from the private sector. This is even lower than when we last reported in 2014 when we found that, between April 2011 and March 2015, 25% of partnership funding had been secured from the private sector (paragraph 2.19).

Managing future flood and coastal erosion risk

19 The government's new policy statement and EA's strategy are a significant step forward, but lack clarity in important areas. The previous policy statement (2009) and strategy (2011) were narrowly focused on project appraisal and developing the organisational structures for flood risk management, but the government has now set out a long-term vision to create a nation more resilient to flood risk. Many of the actions in the government's policy statement are not time-limited or measurable, and some important commitments are not expected to be implemented until well into the future. Neither the policy statement nor the strategy quantifies the level of resilience or risk reduction the government expects to achieve. Responses to EA's consultation on its draft strategy indicated broad support for its objectives: almost three-quarters (74%) of respondents agreed with EA's strategic vision (paragraphs 3.2 to 3.7).

20 Government has substantially increased its future capital investment in flood and coastal defences, but will rely on other uncertain sources of funding to meet its long-term aims. In March 2020, government announced grant-in-aid capital funding to EA of £5.2 billion for the six-year period from April 2021 with £140 million brought forward to 2020-21. This represents a 54% real-terms increase in funding compared with the period 2015-21 and equates to annual average funding of £770 million in real terms. A further £370 million of capital funding over the six-year period has been announced for innovative projects and to accelerate work on projects, taking the total capital funding to just under £5.6 billion. EA's long-term investment scenarios indicate that annual investment from all sources of around £1 billion in real terms is needed, including capital and revenue and investment associated with other risk management authorities. Defra is confident that revenue funding and funding from other sources, including partnership funding, will take total annual investment above £1 billion, but the level of this additional future funding is uncertain (paragraphs 3.11, 3.13 and 3.14).

21 EA estimates that increased investment over the period 2021–2027 will reduce flood risk by up to 11% but has no plans to monitor its progress towards this. EA estimates the investment, including the additional funding from other sources, will better protect 336,000 properties and reduce flood risk by "up to 11%", but it acknowledges that the model used to calculate risk reduction needs improvement as it is highly sensitive to small changes in the input variables and has not changed over the past six years. Defra plans to set out more detail on what it aims to achieve from the programme and how it will be managed in 2021. It also recognises the need to improve how it monitors progress with an action in its policy statement to develop a national set of indicators by spring 2022, but it has not specified whether this will include a measure of overall risk reduction nor, if it does, how it will calculate what it has achieved (paragraph 3.16).

22 The requirement for revenue funding is likely to increase as assets deteriorate more quickly due to climate change and as capital investment growth results in more assets. Revenue funding is used for activities including ongoing maintenance of flood and coastal defence assets. Research commissioned by EA indicates that the cost for maintenance and repairs could increase by between 20% and 70% a year as a result of climate change (sea level rise and increased storm surges and river flows) over the period to 2050. While some of the increase in capital investment may be used to upgrade existing defences, it will also increase the cost of maintenance as the number of assets increases (paragraphs 3.17 and 3.18).

23 Capacity and skills shortages could impact EA's ability to deliver its investment programme and strategy. EA has skill shortages in a number of areas, including engineering, digital and commercial. The shortage of qualified engineers is a long-standing concern and EA saw a 33% fall in qualified civil engineers between 2013 and 2018. While EA has taken action to address this, it currently estimates the need for around 50 (20%) additional qualified in-house engineers to cover the range of projects in its future investment programme. We also heard of capacity issues across local lead flood authorities (paragraphs 3.20 to 3.25).

Conclusion on value for money

24 Between 2015 and 2021, government will have invested £2.6 billion in flood defences. EA is on track to meet government's aim to better protect 300,000 homes, has secured more than £500 million of partnership funding to supplement the programme and expects to achieve an estimated benefit–cost ratio across the programme of 8:1 over this period. However, Defra's narrow focus on the homes better protected target has not necessarily produced the best return on investment and does not represent the full picture. As we approach the end of the current investment period, government does not have a comprehensive measure to demonstrate whether the overall level of flood risk in England is lower now than it was at the start of the programme.

25 Over the next six-year period starting in April 2021, government's capital investment is set to increase substantially to £5.6 billion, with the aim of providing better protection for 336,000 properties and the expectation that the programme will reduce overall flood risk by up to 11%. While the new policy statement and EA strategy are an important step forward, with the new investment period about to begin, Defra has yet to provide full details of what it aims to achieve from the programme, how the programme will be managed and what indicators it will use to measure progress. Unless it develops these, alongside a more robust measure of its progress in reducing flood risk, Defra will not be able to demonstrate convincingly to Parliament that future investment is achieving value for money.

Recommendations

26 Defra should:

a before the start of the new investment period (April 2021), provide a clearer sense of direction to all the bodies involved on what government aims to achieve, and what the measures of success will be;

b work with the Ministry of Housing, Communities & Local Government and HM Treasury to develop a clear understanding of whether flood risk management funding for local authorities is adequate to cover the level of flood risk individual authorities face, and report on this each year starting from 2021-22;

c by April 2021, review its oversight of the programme to ensure it is making the most of existing opportunities to appropriately challenge EA's approach, performance and investment decisions and that it has its own assessment of programme risks;

d ensure, when developing its national set of indicators to track progress, that the indicators are clearly linked to the actions set out in its policy statement and that, where possible, its policy statement actions are measurable and time-limited;

e work with EA to understand what is driving the profile of investment in deprived areas and whether there are any underlying structural issues behind the decline in investment since 2014; and

f work with EA and HM Treasury to ensure funding cycles do not have an adverse impact on EA's ability to manage their investment programme and optimise value for money.

27 EA should:

g update and improve its methodology for calculating the risk reduction achieved from its investment programme and, for each year of the new programme, report publicly on annual progress towards reducing risk by 11%;

h as part of its annual reporting, report on the geographical distribution of investment, including the impact of changes to the partnership funding model and the amount of investment directed to deprived areas, to provide evidence to Defra to help inform policy decisions and government priorities; and

i by April 2021, review and update the current approach to communicating with third-party asset owners, develop supporting tools and a communication plan for EA's local area teams to work with third-party asset owners to ensure asset owners are aware of the condition of their assets and of the need for maintenance where required.