



National Audit Office

Report

by the Comptroller
and Auditor General

**Department for Environment, Food & Rural Affairs
and Environment Agency**

Strategic flood risk management

Key facts

5m

properties at risk of flooding
as of December 2013

£24bn

Environment Agency's
estimate of the replacement
value of flood defence
assets it maintains

£606.2m

total funding for flood risk
management in 2013-14

9.5:1 Environment Agency estimate of the ratio of benefits to costs across all projects in the current flood risk management capital investment programme as of March 2014

£140 million additional funding expected to be sourced through the partnership funding model by March 2015

£270 million additional funds allocated by government following the 2013-14 winter storms

Summary

1 Autumn and winter 2013 and 2014 saw the wettest period in the south of England for 250 years. The extreme conditions tested the country's resilience to adverse weather and its consequences, causing flooding and widespread disruption.

2 Coastal flooding is one of the highest priority risks on the United Kingdom's National Risk Register of Civil Emergencies. As of March 2014, the Environment Agency (the Agency) estimated that 1 in 6 homes in England is at risk of flooding from coastal, river and surface water. Climate change means that the weather is becoming more unpredictable, leading to increased risk of severe weather events. Effective flood risk management is important so that the country is in the best position to protect against these risks, and to safeguard homes, communities, businesses and infrastructure.

3 The Department for Environment, Food & Rural Affairs (the Department) has national policy responsibility for flood risk management and the Agency has a strategic overview role and is responsible for the management of flood risk from main rivers and the sea. There are many other bodies with responsibilities for flood risk management, including local authorities.

4 This report examines the sustainability of current funding approaches, and how flood risk management activities are managed and delivered. It follows on from our previous report in 2011, which looked at flood risk management and the partnership funding scheme.

Key findings

Risks to future sustainability

5 The Government's 2012 Climate Change Risk Assessment reported that climate change will significantly increase flood risk in the UK. This is increasing the load on assets, which may in turn increase operational costs, if current performance is to be maintained (paragraphs 2.16 and 2.17).

6 The Agency's long-term investment strategy (2009) noted that funding would need to increase by an average of £20 million every year, plus inflation, until 2035 if the current overall level of risk was to be maintained. However, between 2010 and 2013, capital and revenue funding was reduced by 18% and 10% respectively. The Agency is currently developing a new investment strategy, due to be published in late 2014, which will update the funding assumptions in the 2009 version (paragraphs 2.2 and 2.18).

7 The government made an extra £270 million available following the winter storms in 2013 which allowed the Department and Agency to respond quickly to events, and to begin restoring the condition of flood defence assets. This included an additional £35 million for asset maintenance in both 2014-15 and 2015-16. In cash terms, this has restored maintenance funding to 2010-11 levels, although this represents a real-terms decrease of 6% between 2010-11 and 2014-15. The additional money following the winter floods established a new peak for total funding in 2014-15. However, excluding this exceptional contribution, total funding decreased in real terms by 10% between 2010-11 and 2014-15 (paragraph 2.2).

8 The Agency has made efficiencies, including a saving of £44 million between 2011 and 2014 in respect of capital construction projects. However, the risk of more severe weather events will put pressure on existing budgets (paragraph 2.3).

9 The Agency has a robust process in place to prioritise maintenance spend, based on the benefits and risk identified by flood risk model data. Annually, it undertakes an exercise to allocate funding for asset maintenance, using its national database of maintenance needs. The Agency fully funds the minimum maintenance needs for all assets, and further funding is then allocated according to benefit–cost priority for each asset system (paragraphs 2.4 and 2.5).

10 The Agency recognises that it needs to make difficult decisions around whether it continues its maintenance of some flood risk assets. For example, there are a number of 'legacy' assets with lower benefit-cost ratios. The Agency funds maintenance in higher risk areas first, and so may not be able to fund maintenance elsewhere (paragraph 2.8).

Impact of funding levels on assets and flood risk

11 As of August 2014, some 1,356 asset systems with a lower benefit–cost ratio (50% of the total) are being maintained to a minimal level.

Assets in the affected systems are likely to deteriorate faster as a result, potentially resulting in a lower standard of protection, as well as increasing capital replacement costs in the long term. This change also suggests that the benefits from the original capital investment in those assets will not be maximised (paragraph 2.11).

12 The Agency has done work to model what the optimum level of capital and maintenance funding split would look like.

It has modelled, with appropriate caveats, different scenarios to demonstrate what the impact might be on whole-life cost. Its work did conclude, however, that overall the impact of new assets on maintenance costs is hard to quantify (paragraphs 2.14 and 2.15).

13 The Agency has not communicated to communities the local effect on future flood risk from the de-prioritisation of maintenance in some areas.

The Agency holds estimates of the relationship between maintenance expenditure and asset lives for various flood defence types, and it has used this information nationally, but it has not communicated the effect of this change in maintenance regimes in some local areas in future years (paragraph 2.12).

14 The Agency has prioritised funding for maintenance on a national level, primarily based on benefit–cost ratio; this is calculated by, among other factors, the number of homes in an area. These decisions will have significant effects on individual geographical areas.

In particular, where the Agency deprioritises maintenance in areas where assets have lower benefit–cost ratios, asset failure in these areas will become more likely unless the management of those assets is taken on by another body (paragraph 2.5).

15 The Agency has analysed the relationship between deterioration maintenance for its floods structures and defences and flood risk.

The Agency estimates that investment in maintenance of flood defences and structures gives it a benefit–cost ratio return of 7:1 (paragraph 2.13).

Capital and revenue funding

16 From 2015, the capital budget will be approved for a 6-year period,

which provides a longer period of certainty about funding allocations and helps medium-term planning. The Department and Agency told us that this has provided a better opportunity to plan and identify future projects against other capital priorities to ensure funding is earmarked at the appropriate time (paragraph 2.4).

17 The allocation of maintenance funding for 2015-16 is for a 1-year period, in line with government policy.

This makes it more challenging to plan long term and to make efficiency savings, because of contracting uncertainties and availability of funding (paragraph 2.4).

Partnership funding

18 The Department and Agency have implemented a partnership funding model.

The approach aims to increase investment from outside central government and allows the Department to fund a larger number of projects on a part-funded basis (paragraph 2.20).

19 The Department did not set funding targets against which to judge the success of the new model, so it is difficult to evaluate whether it has been a success.

However, more partnership funding has been attracted than it initially expected. The Department's policy impact assessment included a 'best-case' assumption of £125 million additional contributions by 2014-15, and between April 2011 and March 2015 it will have attracted an estimated £140 million in funding. Some 75% of contributions have come from other public sector sources, with 25% directly from the private sector. In addition, a Department-commissioned evaluation of the scheme indicated that, on the whole, the approach is progressing well in meeting its policy objectives (paragraph 2.21).

20 The Department does not have sufficient data to measure accurately the current level of success for partnership funding schemes led by other risk management authorities.

While the Agency's systems capture its own funding allocations to projects adequately, they do not capture contributions in kind. In addition, partnership funding contributions collected by lead local flood authorities and internal drainage boards are not captured until up to 2 years after schemes are completed. This reduces the accuracy and speed with which the Department can measure whether it is achieving its aim of broadening sources of funding for flood risk management beyond central government. It may also result in missed opportunities to improve outcomes from the new model by influencing partner organisations (paragraph 2.23).

Benefit–cost analysis

21 Benefit–cost assessments for capital flood defence projects are robust and well thought through.

The Agency's approach to benefit–cost analysis is consistent with HM Treasury's Green Book. The Agency has produced detailed guidance on identifying the typical benefits and costs of projects, and investment appraisals are clear and thorough (paragraph 2.25).

22 For flood projects, the Agency seeks to secure an acceptable standard of protection while maximising the difference between costs and benefits.

It does not always necessarily select or prioritise projects with the highest benefit–cost ratio, as this would mean the entirety of funding would be directed to a smaller number of projects delivering very high standards of protection in the most populated areas. Benefit–cost thresholds set by the Agency ensure that limited funding is not exhausted on a few high-value projects, and can be allocated across a wider range of smaller-value projects (paragraph 2.27).

23 There is a healthy benefit–cost ratio for floods projects.

The Agency anticipated it would achieve a programme benefit–cost ratio of at least 8:1 for its flood defence projects funded through grant-in-aid for the current spending review period. As of March 2014, it has achieved 9.5:1 (paragraph 2.25).

Flood modelling and asset management

24 The Agency has improved the way it presents flood modelling data, and has committed to more improvements in both sophistication and ease of use.

Since 2011, the Agency has made the likelihood of flooding categories clearer and more consistent with other flood maps and has also improved its understanding of the risks of surface water flooding. The Agency is continuing to improve the data in the National Flood Risk Assessment model. It is publishing information about the reliability of its model data at different scales of risk assessment; undertaking hazard mapping locally to help predict coastal flooding; and examining ways to improve the presentation of flood risk from a combination of sources (paragraphs 3.3, 3.5 and 3.6).

25 The Agency is building its understanding of individual assets to target its resources more effectively and improve its risk management.

It is enhancing its asset management approach by increasing the amount of information available on individual assets. This will assist its ability to make decisions on assets. The Agency expects this new approach, to be launched in 2015, will improve risk management through better targeting of investment and delivering efficiencies in the way asset maintenance is managed (paragraphs 3.11 and 3.12).

Communication and working with others

26 The government's aim is to encourage local communities to take steps to manage their own flood risk. This has brought some necessary complexity into the system. However, beyond this, some stakeholders consider that there is an added layer of complexity that could be simplified and that strategies and plans are not always aligned or complementary (paragraph 3.17).

27 The Agency has engaged directly with communities on key changes which affect them, but the expectations of communities could be better managed.

The Agency has recognised the importance of engaging communities in areas where flooding regularly occurs and is proactive in its communications with these communities. However, it needs to ensure that its communication around changes to maintenance regimes is relayed to those communities affected, so that their expectations are managed (paragraph 3.19).

28 The Department is working with local authorities to publish their flood risk strategies quickly to ensure they are prepared for future flooding events. As of March 2014, only 16% of lead local flood authorities have published their local strategies despite the requirement being in place since 2011. The Parliamentary Under-Secretary of State for Water, Forestry, Rural Affairs and Resource Management has recently written to all lead local flood authorities, asking that they complete their strategies by 31 December 2014 (paragraph 3.16).

Conclusion on value for money

29 The Department and Agency have limited resources to spend on maintaining and enhancing the standard of flood protection in England. The Agency has responded to these constraints by improving cost-effectiveness, and adopting methods for prioritising service delivery which provide a healthy return on investment. On these criteria, the Agency is achieving value for money.

30 However, current spending is insufficient to meet many of the maintenance needs the Agency has identified for its assets. In the areas where maintenance has been deprioritised – typically, where there are a low number of homes – this will increase the danger of asset conditions degrading, so increasing flood risk. The Agency may be faced with decisions on whether to replace affected assets earlier than would otherwise be the case, or to let them lapse. It is reasonable, based on recent experience, to predict a role for community and political pressure in how these decisions play out. (As a rule, our experience is that ad-hoc emergency spending is less good value than sustained maintenance). The impact of climate change will also continue to increase pressure on defences. We conclude that the achievement of value for money in the long term remains subject to significant uncertainty.

Recommendations

31 The Department should consider how funding for flood risk management can be made more sustainable in the medium to long term. It should:

a **Seek to ensure that its maintenance programme protects long-term value for money.** In particular, the Department needs to:

- seek to balance capital and revenue funding in a way that minimises whole-life asset costs, taking advantage of any flexibility in the split between capital and revenue funding which can be secured;
- work with HM Treasury to understand whether it can lengthen the planning cycle for revenue funding in the same way as it has for capital, in order to further improve value for money in procurement; and
- further analyse the effectiveness of the new partnership funding model, based on more comprehensive and timely data than are currently available. Once reviewed, it should then reflect on whether any changes could be made to improve the effectiveness of this model.

- b** The Department and Agency should consider whether a more transparent approach to flood risk strategies and data would improve the general understanding of communities about who has responsibility for flood risk. Together, they should:
- **Build on their engagement with the public**, particularly where maintenance work on flood defences has been changed, reduced or rationalised.
 - **Collect more robust and timely performance management data** from risk-management authorities to help them fully realise the benefits expected from the move to partnership funding.
 - **Continue to monitor the lead local flood authorities' progress with publishing their local flood risk management plans** and take action if these are not produced within a suitable timeframe.
 - **Review the range of strategies and plans in place** to see if they can be amalgamated or rationalised in order to reduce the burden on communities and promote public engagement.
- c** The Department and Agency have made improvements to their flood modelling and asset management since our last report in 2011. To build on this the Department and Agency should:
- **Gather more detailed information on individual asset maintenance costs** to help further optimise the value for money in how they deploy funding for maintaining flood risk assets.
 - **Develop their ability to forecast the effect of asset maintenance decisions on future asset conditions**, in order to analyse more fully the long-term effect of maintenance prioritisation decisions.
 - **Build on the sophistication of flood modelling data** and ensure that both industry and the public have access, within data protection guidelines, so its value is maximised.