The benefits of flood risk management actions and advice

Project Summary SC090039/S

New tools to help quantify the benefits of flood risk management have been developed by a team of researchers led by CH2M Hill.

Large flood defence projects are not suitable, affordable or sustainable in all areas. In such instances, other actions to manage the flood risk have to be considered such as individual property level protection. Even when a large flood defence project is affordable, there are often important actions which enable the project to perform, such as the provision of an accurate flood warning so flood gates can be closed. This leaves us with the question: how to effectively assess the benefit of these different and often interacting management actions?

Recognising this complex challenge, a consortium of researchers from Jeremy Benn Associates and Flood Hazard Research Centre led by CH2M Hill and funded by the Environment Agency and Defra Joint R&D Programme have completed work to close this gap.

Our aim

The aim of the research is to help flood risk managers:

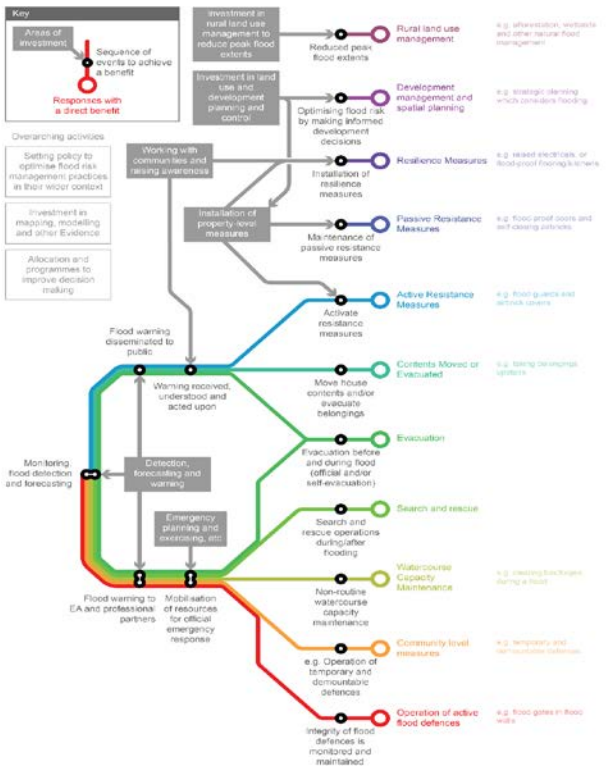
- explore a fuller range of flood risk management options
- identify and justify the selection the right flood management option(s)
- understand the links and dependencies between difference flood risk management actions and account for these links in decisions

What have we developed?

We have developed a toolkit for flood risk managers. This toolkit has four main elements.

The first is a **framework** designed to help visualise the complex relationships between the possible actions to manage flood risk. The framework is a conceptual model of the flood risk management system, designed to help flood risk managers:

- consider a wider range of risk management actions
- understand the dependencies between actions
- communicate their decisions effectively



A framework for visualising the complex relationships between flood risk management actions

New methods have been developed to help quantify the amount flood risk avoided or potential benefits associated with the various project options. These methods express benefits in terms of annual average property damage avoided for the following groups of flood management actions:

- operation of flood defences that depends on a flood forecast or warning, for example, tidal barriers or gates
- property level resistance and resilience, for example, flood-proof gates/doors/airbrick covers and raised electrical wall sockets
- moving household contents out of the way of flood water

These methods also can help quantify the benefits associated which enabling activities including the provision of flood forecasts and flood warnings and raising public awareness of flood risk.

There are also **tools and a supporting user guide** to help calculate values of flood damages avoided. Two spreadsheet analysis tools have been developed to implement the quantification methods described above. The two tools are targeted at routine and more complex appraisal.

Finally there are **data tables** with associated reference sources to allow flood risk managers to complete the calculations required. Through a literature review and case study analysis we have developed a dataset of percentage amounts of property damages avoided. This set of data represents a national average. These data are provided in the report, with guidance on application in for different scales of study.

Links with the Multi-Coloured Manual and other tools

The methods for the calculation of the benefits associated with property level protection and the provision of flood warnings are consistent with the methods presented in the Multi-Coloured Manual published by the Flood Hazard Research Centre. They are consistent with the principles in the FCERM Appraisal Guide.

The tools offer a more detailed method for the evaluation of property level protection schemes where a more rigorous analysis of benefits is required than those that can be generated by the Environment Agency's Partnership Funding Calculator.

When will I find this research useful?

From consultations with a range of flood risk managers we have identified a range of situations where our research would be useful.

- You are developing details of a property level protection scheme for a community, particularly if you are interested in understanding how sensitive the benefits might be to the timeliness and accuracy of a flood warning.
- You are promoting a new scheme to improve the forecasting and warning capability in your area and/or you are planning a flood awareness campaign and you would like to estimate what the economic benefits of these activities might be.
- You are comparing options for a flood defences scheme which includes movable (active) elements that have to be closed on receipt of a flood warning. In particular, you would like to know how the benefits of that scheme might differ from to a more passively designed option.

These potential uses are illustrated in the report through the use of case study examples.

How has this research helped the Environment Agency?

This research has been used to help national level planning and prioritisation of investment in the flood risk management. It has been used in drawing up the Environment Agency's long-term investment strategy and in the Flood Incident Management Investment Review.

This research is also helping the Environment Agency understand how effective the provision of its development management advice is and is informing the redesign of the approach to the National Flood Risk Assessment (NaFRA).

This summary relates to information from Project SC090039, reported in detail in the following output(s):

Report: SC090039/R
Title: Quantifying the benefits of flood risk management actions and advice – Synthesis Report

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