

FLOOD-ERA: The effectiveness and efficiency of non-structural flood risk reduction measures, and implementation constraints

Technical Summary: FD2602

Joint Defra / EA Flood and Coastal Erosion Risk Management R&D programme

Background to R&D project

We report here the results of the UK element of the FLOOD-ERA project. The overall FLOOD-ERA report covers all the work undertaken in four countries (Germany; Austria; England and Scotland). FLOOD-ERA is one of the seven projects being mounted in the ERA-NET CRUE initiative. The coordination role of Defra UK under ERA-NET CRUE is itself funded by the ERA-NET Scheme under the 6th Framework Programme: ERAC-CT-2004-515742.

The theoretical or conceptual framework for FLOOD-ERA is that decisions about using structural measures (SM) and non-structural measures (NSM) for flood risk management are made under particular policy, institutional and other 'contexts' that determine what decisions are made. One of the 'contextual factors' is the availability of appropriate methods by which to evaluate the effectiveness and efficiency of these measures; inadequacy here appears to stifle progress.

Objectives

The following objectives have been set for the FLOOD-ERA research project as a whole:

- To categorise SM and NSM in new and innovative ways;
- To develop an outline methodology for evaluating the effectiveness and efficiency of SM and NSM;
- To analyse the context conditions that may influence the choice of SM and NSM;
- To identify the site-specific effectiveness and efficiency of such measures and the influence of selected context conditions on their choice; and,
- To derive recommendations for the improvement of flood risk management strategies.

To cover all these items, a combined research design has been chosen with (i) policy and analysis through the scrutiny of documents, (ii) in-depth interviews of decision makers, and (iii) six case studies (in Germany, the United Kingdom and Austria). This Summary reports on just the UK research.

Results and conclusions: policy analysis

The international literature suggests that non-structural measures are best developed within innovatory *mixes* of structural and non-structural measures, rather than as stand-alone options. A multi-disciplinary approach is required in order to avoid the mistakes made in the past (e.g. in the USA), to avoid the default option always being a structural one.

Non-structural flood mitigation measures warrant more focused attention from flood managers and decision-makers. The management contexts (and their institutional characteristics) in which flood risk management in general, and non-structural measures in particular, are embedded are particularly important. Thus NSM cannot "promote themselves" in the same way that structural measures can be "seen" to be successful (i.e. by holding back flood water). They will therefore need to be evaluated differently, according to (or relative to) their management context, not in an absolute sense.



Results and conclusions: case studies in the UK [summary]

England. In the English case study of the **Lower Thames**, the conclusions are that NSM are less efficient than SM, and are seen as likely to be less effective. The professionals engaged in this work do not see personal advancement coming from implementing NSM, and see evaluation problems with NSM that make them "suspect". The public wants full protection, rather than the lesser protection that NSM brings. Politicians appear to support this position, against the policy drive of Defra for a more balanced approach. Limitations on revenue expenditure also discourage NSM, which use this kind of finance, and the PAG project appraisal guidance favours SM rather than NSM in its approach and language. Transaction costs appear not to be important either way.

Scotland. In the Scottish case study of the **River Clyde in Glasgow** the conclusions are that there appears to be a more pragmatic approach here, using whatever measures enhance risk reduction and at the same time meet the parallel goals of pollution reduction, and urban regeneration; the three are inextricably linked. Benefit cost technique constraints on using NSM are there, but do not seem to dominate. Most flood risk engineers are located in local authorities rather than a stand-alone Agency as in England. As a result they are more flexible in adopting flood risk measures and subject to fewer professional constraints in favour of SM. National policy in Scotland seems to put NSM measures on the same footing as SM, and the target of the Commonwealth Games in Glasgow in 2014 means that pragmatism and "getting things done" appears to be the dominant attitude.

Overall conclusions

Risk perception is not the impediment to the implementation of NSMs that we considered it might be. Economic efficiency may be such an impediment, and that judging this efficiency is difficult and may be the reason for the low levels of measured efficiency. Most NSMs investigated are effective in the tasks that they are set, however, in terms of promoting public safety, recovery from flood events, and pre-flood risk reduction, especially spatial planning. However, take-up levels are often only poor, because of professional biases, inadequate policy strength, and limitations in the appraisal system, etc. Nevertheless, where there is the commitment to implementing NSMs (as in Scotland) they can be implemented.

Recommendations for government and its agencies:

1. Reinforce and clarify **policies** with regard to NSMs, so as to build more confidence in their development and implementation;
2. Ensure that the **appraisal system** for decision making, as it evolves, does not discriminate against NSMs as it appears to have done in the past;
3. Develop **better data and information on the costs of NSMs** against which to compare their efficiency and effectiveness;
4. Work to remove **the other impediments** to the implementation of NSMs, including professional opinions/preferences, funding arrangements, and the appraisal system and its NSM data bases.

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This R&D Technical Summary relates to R&D Project FD2602 and the following R&D output:
R&D Technical Report FD2602/TR – **Systematisation, evaluation and context conditions of structural and non-structural measures for flood risk reduction: FLOOD-ERA Report for England and Scotland, Published October 2008.**

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The above outputs may be downloaded from the Defra/EA Joint R&D FCERM Programme website (www.defra.gov.uk/environ/fcd/research).

