

Final Project Report

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Project title

The Appraisal of Human-Related Intangible Impacts of Flooding

DEFRA project code

FD2005

Contractor organisation
and location

Risk & Policy Analysts Ltd
 Farthing Green House
 1 Beccles Road
 Loddon, Norfolk NR14 6LT

Total DEFRA project costs

£ 292,617

Project start date

01/01/01

Project end date

31/03/03

Executive summary (maximum 2 sides A4)

Background

There are perhaps two million properties at risk of flooding in England and Wales. Flood and coastal defence projects are orientated towards the protection of 'tangible' assets such as property, agricultural land, infrastructure, services, roads, etc. Although recreational impacts are sometimes accounted for in the associated economic appraisals, environmental and health impacts (including loss of life) are rarely included.

Main aims

The aim of this major Defra/Environment Agency funded research project was to develop a robust, yet simple-to-use, methodology so that the impacts on human health and well-being can be accounted for in assessing the benefits of flood alleviation measures.

It is intended that the methodology will be applicable to all levels of appraisal, from policy and programme evaluation to the appraisal of individual flood alleviation schemes. Furthermore, it is likely to be incorporated into Defra's Project Appraisal Guidance documents (such as PAG3 on economics).

Results

The work was carried out in two phases:

- Phase 1 - to develop and validate survey instruments using focus groups and pilot surveys for i) health impacts; and ii) estimation of WTP (willingness to pay); and
- Phase 2 - to undertake a national survey and, based on the results, develop an economic appraisal methodology.

Two types of questionnaire were developed during Phase 1. The first of these covered the health impacts of flooding as well as the willingness to pay (WTP) to avoid such impacts, and was designed to be answered only by those who had experienced flooding within their house since January 1998. The second questionnaire was designed to explore the WTP of those who had not been flooded but were at risk of being flooded.

The initial development of the questionnaires involved nine focus groups and a set of one-to-one interviews which were held at various locations in England during autumn 2001. This was followed by a pilot survey (with 162 face-to-face interviews) which was carried out during spring 2002 in six locations. However, it was determined, in consultation with the Project Advisory Group, that further development work was required if the survey instruments were to be reliably used in the planned main survey. Following a series of trial interviews in August 2002, the revised questionnaires were piloted (with 53 face-to-face interviews) in two locations during October 2002.

Overall, it was found that the use of the revised questionnaires worked successfully under 'field conditions' (i.e. when administered by a market research company) and it was decided that the study could proceed to the main survey work (Phase 2).

The main survey (Phase 2) involved 1,510 face-to-face interviews (983 flooded and 527 at risk respondents) in 30 locations across England and Wales in autumn 2002. All 30 locations had suffered fluvial or surface water flooding to varying degrees since January 1998.

The results demonstrate that flooding causes short-term physical effects and, more significantly, short- and long-term psychological effects. In this study, a wide variety of health measures were used including the General Health Questionnaire (GHQ-12) and the Post Traumatic Stress Scale (PTSS). Overall, it was concluded that the GHQ-12, if applied retrospectively to the 'worst time' following the flood, provided a reasonable measure of the short-term psychological effects whilst the PTSS provided a reasonable measure of the long-term effects. The degree of health impact was associated with a wide range of factors including socio-demographic factors (especially prior health and age), flood characteristics (especially flood depth) and post flood events (especially problems with insurers in settling claims for flood damage, emerged as the most important factor).

More than 60% of flooded and at risk respondents, expressed a willingness-to-pay (WTP) to avoid the health impacts associated with flooding. Of those that did not provide a value, some provided genuine zero value bids (for example, on the grounds of not being able to afford to pay extra amounts). When these were accounted for, the overall mean WTP values for flooded and at risk respondents were about £200 and £150 per household per year respectively. On the grounds that those that had been flooded had a better appreciation of what it means to be flooded, the higher value was taken forward. As for the health impacts, the WTP values provided by flooded respondents were associated with a wide range of factors, but income and extent of long-term psychological effects (i.e. stress) were among the most important influencing factors. However, the most important factor was age with people in their 50s having the highest WTP values. It was also this age group which suffered the greatest short- and long-term psychological effects.

Recommendations

It is recommended that the value of £200 per household per year be taken as representing the benefits of reduced health impacts as a consequence of a significant reduction in the risk of flooding.

A simple methodology for incorporating such benefits into the cost-benefit analysis of flood and coastal defence schemes is recommended and was applied to four case studies. The results from the case studies suggest that although the economic appraisal will tend to be dominated by the much larger 'tangible' losses (damage to property, etc.), the inclusion of health impacts will, in some cases, lead to the selection of options with higher standards of protection.

Finally, it is recommended that consideration be given to the merits of undertaking further work to assess the health impacts on other groups who may be affected by flooding, with particular regard to the impacts on those who run small businesses (such as shopkeepers).

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Scientific report (maximum 20 sides A4)

See main report