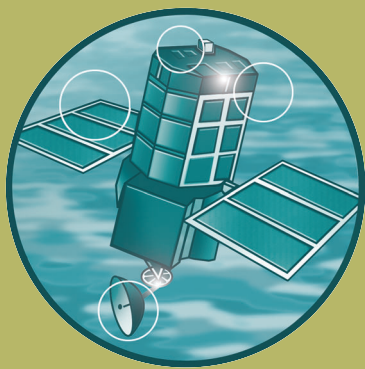


Supporting the development of a social sciences strategy for Flood and Coastal Erosion Risk Management R&D

R&D Technical Report FD2604/TR2

Approaches to social sciences in FCERM

R&D 2006/7



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

Supporting the development of a social
sciences strategy for Flood and Coastal Erosion
Risk Management R&D

R&D Technical Report FD2604/TR2
Approaches to social sciences in FCERM
R&D 2006/7

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Statement of use

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Executive summary

This report summarises work carried out to understand the approach to social science within the Defra/Environment Agency Flood and Coastal Erosion Risk Management R&D programme (FCERM R&D programme). The work was carried out in 2007 drawing on documents that were current at that time.

This report is part of a larger project which has provided support to the development of a social sciences strategy for the FCERM R&D programme.

The aim of the work here was understand, from a number of perspectives the approach to social sciences research within the FCERM R&D programme in 2006/07.

The Joint Flood and Coastal Erosion Risk Management Research and Development is a programme jointly run between Defra and the Environment Agency. It has existed in its current form since 2005. The FCERM R&D programme consists of four research themes:

- Strategy and Policy Development (SPD)
- Modelling and Risk (MAR)
- Incident Management and Community Engagement (IMCE)
- Sustainable Asset Management (SAM)

Each theme has a Theme Champion, Theme Manager and a Theme Advisory group.

Approach

Three main sources of information were used to establish the current approach to social science research within the FCERM R&D programme themes:

- Analysis of Research and Objectives (RO) statements and workplans for each theme. These documents set out the vision, aims, objectives and current projects for each of the themes.
- Two rounds of interviews with the four themes' Champions and Managers.
- Analysis of the social sciences' contribution to past, ongoing and proposed projects.

The analysis of the information collected focussed on three areas:

Rhetoric - i.e. mention of key words such as 'social sciences' but also related topics (e.g. attitudes, behaviour, social, risk), methods (interviews, workshops, stakeholder engagement), interdisciplinary, transdisciplinary, multidisciplinary, etc.

Figures - looking at the number of projects which had a social science input, the type of input (e.g. small role, equal role in an interdisciplinary project, central role). This part of the analysis also looked at the contractors used by the four themes and the budget of the social sciences components/ projects versus the technical aspects.

Views and values - based on the interviews with the Theme Managers and Champions this focussed on the perceived value of the social sciences for their theme and flood research in general, their views on the possible future contribution of the social sciences to the research programme.

Key findings

Rhetoric: There is space for social sciences and cross-disciplinary working in all the themes with words like systems, sustainability, holistic mentioned in the RO statements and workplans. Many areas were mentioned in the interviews, sometimes implicitly for social sciences investigation (e.g. attitudes/behaviour, governance, community resilience, risk communication). Many projects use social science methods (e.g. questionnaires and interviews).

Figures: There were few social sciences projects (past and present) representing a narrow range of disciplines and few cross-disciplinary projects (i.e. projects with both social and natural sciences/engineering). This varied across the four themes with most social sciences in the SPD theme. Social sciences work was often led by the big engineering consultancies in all the themes.

Views and value: There was a general view that social sciences are very valuable to the programme but that varied by theme with three perspectives emerging:

- Instrumental 'if it works use it' perspective;
- not relevant 'not for our theme';
- sceptical support 'valuable but... prove it'.

There was also a general view that the social sciences use too much jargon. There was also an emphasis on obtaining simple answers to complex questions and lack of experience in evaluating the quality of social science research.

Conclusion

This report provides a useful analysis of the role of social sciences in the FCERM R&D programme. It has informed the development of a vision (see final summary report¹ for details) and narratives for each of the themes together with key opportunities to embed social sciences in the FCERM R&D programme.

¹ TWIGGER-ROSS, C, TAPSELL, S, FERNÁNDEZ-BILBAO, A, WARBURTON, D, SHEATE, W, DAVOUDI, S, FIELDING, J (2008) Supporting the development of a Social Sciences Strategy for FCERM R&D: Social Science within FCERM Research: Practice and Future Prospects. R&D Technical Report FD2604/TR

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1. Introduction, background and method

This report summarises work carried out to understand the approach to social science within the Defra/Environment Agency Flood and Coastal Erosion Risk Management R&D programme (FCERM R&D programme). The work was carried out in 2007 drawing on documents that were current at that time.

This report is part of a larger project which has provided support to the development of a social sciences strategy for the FCERM R&D programme.

The aim of the work here was understand, from a number of perspectives the current approach to social sciences research within the FCERM R&D programme.

1.1 Background

The Joint Flood and Coastal Erosion Risk Management Research and Development programme carries out the R&D for flood risk management. It is a programme jointly run between Defra and the Environment Agency. It has existed in its current form since 2005 when there was a review of the whole programme (Penning-Rowsell et al 2005) after which the thematic structure was changed.

The FCERM R&D programme consists of four research themes:

- Strategy and Policy Development (SPD);
- Modelling and Risk (MAR);
- Incident Management and Community Engagement (IMCE);
- Sustainable Asset Management (SAM).

Each theme has a Theme Champion, Theme Manager and a Theme Advisory Group. The Theme Advisory Groups (TAGs) are made up of both internal and external experts in different relevant aspects to each theme. Their role is to advise the Theme Champion and Managers on the structure of the research programme and link with external research of relevance. The TAGs meet twice a year to discuss and approve the programme. Defra manages the Strategy and Policy Development (SPD) theme while the Environment Agency runs the other three themes. Until April 2007 the three themes managed by the Environment Agency were located within the Flood Risk Management (FRM) function of the Environment Agency. Since April 2007 these themes have moved to be part of the wider Science function within the Environment Agency.

The whole programme is overseen by a Joint Programme Manager for Defra and the Environment Agency. The budget for 2007/2008 is £4,425,442. The table below shows the percentage split across the themes.

Theme	Total 07/08	Percentage split
Strategy and Policy Development (SPD)	£505,999	12.61%
Modelling and Risk (MAR)	£961,580	21.81%
Incident Management and Community Engagement	£716,654	16.26
Sustainable Asset Management	£1,062,741	24.11%
Flood Risk Management Research Consortium ²	£380,392	8.63%
FLOODsite ³	£150,000	3.40%
Reservoir Safety	£443,666	10.06
Miscellaneous	£15,000	0.34%
Programme Management (Agency and Defra)	£139,500	3.16%
Overall	£4,425,442	

Table 1: Financial summary for programme 2007/2008 adapted from Joint Programme Advisory Group Paper 1 November 2007 Recent Progress

1.2 Method

In order to establish the current approach to social science within the FCERM R&D programme four activities were undertaken:

- Collection and analysis of RO statements and workplans;
- Interviews with the Theme Champions and Theme Managers;
- Collection and analysis of lists of past projects, ongoing projects, proposed projects and summaries of current projects where available.

1.2.1 Data collection

Collection of RO statements and workplans for each theme

Each them has a RO (Research and Objectives) statement together with a workplan. These vary from theme to theme but essentially set out the vision, aims, objectives and current projects for each of the themes. For our analysis we used the most recent versions of the RO statements and workplans which were produced between

² This is a programme of research between EPSRC, NERC, which has run from 2002-2007

³ This is an EU project see www.floodsite.com for further details.

January and April 2007. These documents are reviewed every three years. Copies of the documents can be found in Appendix 1 (in a separate volume).

Interviews with Theme Champions and Managers

Interviews were carried out with Theme Champions and Theme Managers for each of the four research themes. The Theme Champion and manager were interviewed together so that it was possible to obtain an overall view from each theme. Each pair was interviewed twice, making eight interviews in total. Clare Twigger-Ross⁴ interviewed the Theme Champion and manager from the Strategy and Policy Development theme. She interviewed the Theme Manager and Theme Champion of the Sustainable Asset Management theme for the first interview and the Theme Manager and theme advisor for the second interview. Sue Tapsell⁵ interviewed the Theme Champion and manager from the Incident Management and Community Engagement theme and the Theme Champion and manager from the Modelling and Risk theme.

The first interview for each set of Theme Managers and Champions followed the same set of questions which can be found in Appendix 2. The second interviews followed from the first and whilst broadly they covered our initial analysis of documents, each one was tailored to be appropriate to each set of Theme Champions and Managers.

The interviews took between 1.5 – 2.5 hours each and were recorded by tape and/or by notes. The interviews took place between March and July 2007. Notes were then written up from the interviews and these were sent back to the interviewees for agreement.

Collection of lists of completed projects, ongoing projects, proposed projects and summaries of current projects where available for each theme

The aim was to examine all the projects completed and ongoing to understand the current approach to social sciences through the balance of projects. For the completed projects we decided to look at all projects that had been completed within the last five years (between 2002 and 2007). Titles and technical summaries were gathered for each of the projects. These were put into a spreadsheet ready for further analysis. We gathered information from Defra/Environment Agency websites, lists in workplans and from the Theme Managers for each of the themes. The lists were then sent back to the Theme Managers for confirmation/amendment where appropriate. The completed tables with the lists of projects can be found in Appendix 3.

1.2.2 Analysis of material

Textual and thematic analysis of RO statements and work plans

⁴ Collingwood Environmental Planning

⁵ Flood Hazard Research Centre, Middlesex University

Each of the RO statements and work plans were analysed using the following framework:

- In terms of ‘mentions’, meaning if key words are mentioned around:
 - Social science topics e.g. attitudes, governance, social, cost benefit analysis etc;
 - Social science methods and approaches e.g. interviews, questionnaires, surveys, (possibly workshops, stakeholder engagement which seem to be the way qualitative data is usually collected);
 - Social science itself;
 - Interdisciplinarity, multidisciplinary, transdisciplinarity.
- In terms of ‘framings’ of issues. This is focussed on the context in which those mentions may occur and whether or not they could be put into broader category of sociotechnical framing or a technoeconomic framing where:
 - ‘technoeconomic – the idea that if technical knowledge is rigorously tested and demonstrably proved, then consumption choices will be made rationally
 - sociotechnical – the idea that science is a sociocultural phenomenon and that the technical is always in relationship with wider social, economic and political processes’ (Guy 2004, p. 687).

In our proposal for this piece of work we discussed how the move from ‘holding back the water’ to ‘living with floods’ warrants a change in frame in terms of research from a technoeconomic framing towards the sociotechnical. A technoeconomic framing within FCERM means a focus technical expertise with evaluation focussed on economic evaluation together with a sense that ‘if only people understood the risk from flooding then they would do the right thing in a flood’, that is, that knowledge and understanding lead to actions. Further that the right knowledge will lead people to do the right actions. A sociotechnical approach with FCERM would mean a focus on understanding the different perspectives on FCERM issues, examining the physical systems of flooding in terms of the social systems that they are made sense by and situated in.

Lists of completed projects, ongoing, proposed projects and summaries of current projects where available

In order to establish the extent and nature of social sciences research within each them, we analysed these documents in the following manner:

- In terms of the subject area and whether there was an obvious social science focus - this was classified in terms of the extent to which social science had a a) central role b) equal part in an interdisciplinary project c) bit part d) no part. If they were rated a or b or c then we classified them further in terms of
 - approach – quantitative or qualitative⁶

⁶ “Research questions are often thought of in terms of being quantitative (dealing with numbers) or qualitative (dealing with words), or some combination of the two. Research questions which are considered to be quantitative usually involve development of a hypothesis which can be tested

- core area e.g. attitudes/perceptions, engagement, governance, economics
- If they were classified as d then we did not look at them further in terms of the contractors. Contractors were listed in order to show the range of contractors.
- In terms of methods used e.g. any questionnaires, focus groups, etc.
- Where possible the monetary value of the projects was also noted.

against empirical, quantitative data collected using a deductive process. The quantitative nature of the data enables statistical analysis to test the pre-determined hypotheses. In contrast qualitative research questions are often exploratory in nature, using methods to generate data about the meaning of the topic of interest, and the processes by which it has a social reality. Initial analyses may address tentative questions which emerge and evolve through the process of analysis and interpretation.” (from Background Paper, included in Appendix 4.)

2. Findings

The overall outcome for Flood Risk Management R&D is stated as:

'Manage risks from flooding and coastal erosion through an integrated portfolio of approaches to reduce the threat to people and property and deliver the greatest environmental, social and economic benefit consistent with sustainability' (SPD workplan, March 2007).

Whilst there is an overall outcome for the R&D programme each theme is different in the way it presents information making comparisons between themes less straightforward. Given this, it was felt useful to present one theme at a time with all of its analysis.

2.1 Strategy and Policy Development (SPD) Theme

2.1.1 Textual and thematic analysis of RO statements and workplans

The overall aim of the SPD theme is to support Defra and the Environment Agency in the development of flood risk management strategy and policy. It is clear that the main developing policy areas are those identified in the *Making Space for Water Implementation Plan*⁷. Further, and in contrast to the other themes it is stated that once a policy line has been established the development of tools and techniques to implement that policy will be passed on to one of the other three research themes. Beyond this, the overall objective is stated as 'Risk from flooding is managed in a way which furthers sustainable development'.

From the programme vision in the RO statement, the SPD programme is focussed on providing 'evidence and innovation' (E&I) to policy areas, together with reviewing the strategic needs for E&I and using some longer term horizon scanning to support policy development in the future.

Looking more closely at the RO statement and the workplan there are mentions of social science related terms and phrases. Below are presented the objectives set out in the RO statement with key words highlighted:

- Development of Environment Agency strategic overview taking account of influence of **changing attitudes, demographics and economics** on FCERM **governance**.
- A more integrated approach to urban flood issues: Reconciling the **needs of multiple players**, managing flood risk in relation to other issues, integrated urban drainage planning, strategic approaches to flood resilience and urban sub-catchment run-off.
- Improved understanding of groundwater flood risk with clearer allocation of responsibility and **public understanding** of both the level of risk and the feasible solutions that are likely to be available.

⁷ See SPD workplan in Appendix 1 (included in a separate volume)

- Improved understanding of the **impacts of land management** on flood risk elsewhere, including the effect of reducing levels of agricultural flood protection on areas downstream, impacts on the Agricultural industry, **the effectiveness of funding mechanisms** and other land use policy levers.
- Identifying the **barriers & incentives** to deliver better environmental & **social outcomes**: Taking into account WFD, impacts of climate change.
- Development of ‘Adaptation Toolkit’ covering novel forms of coastal erosion risk management that can improve **acceptability of sustainable coastal management practices** that result in property and land loss.
- Broadening outcome definition and risk management tools and guidance: To improve **economic appraisal** methods and **other economic methods** to **account for changing demographics/economics, societal values and preferences**.
- Review recommended approaches to Climate Change: Determine the impact of climate change on flood flows, sea level, surges and waves and review existing indicators and FCERM standards and practices, defining new ones where required.
- **Building stakeholder and community engagement: Consultation (methodology)** and **communication** with all those affected by FCERM is required to determine what level of risk is **acceptable** and to determine the most effective way of maintain a level of **public awareness**.
- **Land Use Planning** (Defra/ Environment Agency inputs): Including development and flood risk, and the integration of FCERM and spatial planning.
- **Encouraging and incentivising increased resilience to flooding: Improving resilience in urban flood protection and the use of temporary defences for individual properties.**
- **Horizon scanning and long term policy needs.**

Within the Rationale part of the RO statement there are again mentions of social science topics which are highlighted below:

‘Climate change and changes in **socio-economic consequences** of flooding are major future pressures influencing flood risk. Work carried out within the Joint Defra/ Environment Agency FCERM R&D Programme supports moves to holistic approaches to sustainable flood risk management. This move places increased emphasis on risk management strategies, coordination of approaches across different aspects of flood risk, **influencing behaviour**, appropriate development policies, effective planning for extremes and other policy areas. New directions will include the development and demonstration of sustainable solutions optimising **economic**, environmental and **social benefits**. Finding ways of developing **governance** and funding arrangements to better engage those affected, incorporate their **preferences and aspirations** and provide systems for a better sharing of **costs and benefits** between those who create risks with those who benefit from the risk management measures and the wider tax-paying community. In addition, there is a mature understanding of the ongoing efforts and processes needed to keep the evidence and innovation needs of flood risk management aligned with the pressures and opportunities created by the principal drivers for change of flood and coastal erosion risk, namely climate change and **socio-economic pressures**. FRM can also

make a major contribution to water-related biodiversity and conservation goals. There are often significant **amenity and access issues** at stake in implementing management measures as these are an integral part of all river and coastal management activities.’

The RO statement does not refer explicitly to the social sciences, the type of research methods or disciplines that are might be considered necessary in order to help address some of these key issues. In general, there is no discussion of the nature of the research process, criteria for evaluation etc., rather the focus is on the policy issues that need to be examined.

There is also no mention of how disciplines might work together e.g. inter-, trans-, cross. However there are a number of references to ‘holistic’ and ‘sustainability’, which suggests room for approaches that bring together disciplines and from the project analysis there are projects that are inter-disciplinary within the social sciences in this theme.

The workplan sets out the planned and completed activities for the SPD theme including a five year outline plan for achieving the ROAME aims and objectives. As such within the theme coverage it links directly to the RO objectives. It elaborates the programme vision set out in the RO statement suggesting that the workplan will:

‘Support Evidence & Innovation to all key policy areas covered by the 'Making Space for Water' implementation programme, in particular,

- New approaches to risk and appraisal;
- Developing a holistic approach, including a portfolio of measures;
- Improving sustainability, including social issues;
- Climate change impacts on policy;’

Here there is a specific mention of ‘social issues’, although it is not elaborated on. However, in the workplan reference is made to ‘The current project to draft a strategy for social science⁸ in the research programme will help embed social science within the wider context of FCERM’. This is a clear commitment to social sciences in FRM.

Together these can be grouped under the following headings providing a range of social science topics for exploration and invokes the use of a wide range of disciplines and approaches:

- Changing attitudes, societal values, preferences, aspirations;
- Public understanding and awareness;
- Encouraging and incentivising increased resilience, acceptability of risk; influencing behaviour, barriers and incentives;
- Demographics, economics, socio-economic pressures;
- Governance, relationship between FCERM and spatial planning;
- Stakeholder and community engagement;

⁸ Referring to the project of which this report is a part.

- Cost and benefits, social benefits, socio-economic consequences;
- Amenity and access;

2.1.2 Findings from the interviews with SPD Theme Champion and Manager

Aims and objectives and key questions for the SPD theme

The aims and objectives of the theme were characterised as *'to provide a sound evidence base for new [FRM] policy development'*.⁹ The emphasis on evidence being robust enough to support policy development was an issue that ran through the interviews.

In discussing the role of evidence in policy development, the relationship between policy development and research was described as *'iterative...as policies develop research is needed and also out of research comes new thinking on policies'*.

Given this, however, a clear separation of policy from evidence was emphasised. In addition to the clarity of the role of evidence within FRM policy making cycle, the links with the other themes was highlighted as noted within the RO statement and workplan. It was suggested that once the policy theme had researched a new policy area, the tools needed to support that policy area would be developed in the other three R&D themes for example work on a policy on risk management would be carried out in the SPD theme but would then pass to the MAR for tools to support that policy to be developed further.

When considering what questions the theme aims to address, three themes emerged:

- Attitudes and behaviours but not in isolation of physical systems – *'a lot is about behaviours and societal attitudes, attitudes towards society but also about understanding physical systems and where the limits of intervention are'*.
- Practical policy solutions - emphasis is given to research that helps develop policy solutions that are practical and able to be implemented.
- Cost and benefits – *'costs and benefits in their widest sense of policy interventions'*.

The value of social science to FCERM

Social science was seen as very valuable to FCERM. In discussing its value the interviewees elaborated on areas that they felt social science research could be of use:

- Perceptions of and attitudes towards flood risk.
- Understanding different sections/groups in the population.
- Individual decision making processes.
- The role of information: what sort of information do people react to positively, what sort of information do they the react to negatively.

⁹ All quotes come from the interviews carried out with David Richardson and Sue Antonelli.

- Behaviour change: what will get people to take the right sort of actions, what will encourage particular types of behaviour

Key criteria by which SPD projects are judged to have been successful

In discussing the manner in which projects are evaluated and how success is measured themes around the research process in general, together with the relationship between policy and research emerged. The criteria for a successful project centred around how the research is used, whether it is taken into policy guidance together with the substantive conclusions of the project. In referring to an example of research that was less successful the Theme Champion said '*but the results of the research showed that it was more complex and needed to be much more comprehensive with explanations of risk, but in three line parliamentary answers that is an unrealistic expectation*'. This shows an emphasis on producing simple, useable results and that if results do not fit into a useable format then a project might be considered less successful.

However, criteria for evaluating the quality of research are not used for evaluating projects. For example, there is no formal assessment of robustness of the findings and the quality of the research. Whilst there maybe some informal peer review through workshops etc there is no formal review process in place. Surveys are subject to the Defra survey control unit which means that they are scrutinised. However, other research methods such as interviews and focus groups are not to be subjected to the same scrutiny, although it was thought they could be if that was required.

The approach to quality assurance (QA) is that in most projects they will try to ensure quality by firstly giving weight to contractor experience and expertise in the tender selection process and then to having effective challenge during the work through the project steering group. These are the stages at which QA is felt to be most effective in influencing the quality and outcome of the work. The Theme Champion's view is that with these safeguards in place it would be 'overkill' to then routinely review methodologies etc after the work was completed although he also agreed that sometimes they should do more to record final reviews and feedback the results, and more formal external peer review will sometimes be appropriate.

The emphasis was on research providing direction, and it was acknowledged that '*A project that tells you what not to do can be as useful as a project that tells you what to do*'.

Constraints and facilitators faced in trying to achieve aims and objectives

The key constraints perceived that the TAG face in terms of trying to achieve those aims and objectives were lack of funding and staff resources '*more the latter in terms of generating ideas and supporting the implementation of research both the up and down stream of the research process*'. The emphasis was on not having enough staff who were able to frame the research and then see it through to implementation. There are a large number of research projects underway at any one time, and using

those findings in policy development will be more successful if there are staff to champion them through that process.

On the issue of facilitators it was felt that the policy theme has positive relationships with stakeholders together with a reasonably high profile with ministers. FCERM policy works closely with the FCERM policy research theme and is probably helped by the relative stability within the theme, with the Theme Champion having been involved in FCERM research and its previous incarnations for at least ten years. This continuity means that relationships can and have been built

Understanding of the social sciences and social science research

A number of themes emerged around the nature of the social sciences whilst discussing the interviewees understanding of them. These are elaborated on below:

Social sciences information as common-sense

In this first theme a frequently heard comment was made about social sciences being common sense. It was further suggested that perhaps *'the social sciences put a framework around it that mystifies it and that doesn't help its cause....I think there is a lot of common sense stuff there which ...are very good principles in which to have a line of thinking and it is just making sure that everyone understands that that's a thread to a decision'*. This links to the second theme about the use of jargon and language.

Social sciences language as 'mystifying' and containing a lot of jargon

It was felt that the social sciences language needed to be demystified and simplified so that findings could be understood by everyone. This idea together with the idea that social sciences information is common sense suggest that it will tell you things you already know together with an idea that really people have this knowledge already and that perhaps social sciences are obscuring useful information with jargon.

Social sciences research as costly

A further theme to emerge was the idea that social sciences research is costly to do well. One project that had carried out a survey of 1000 people was mentioned several times as an example of good social sciences research but also mentioned as a big project, costing a lot of money and therefore in many ways an exception. The cost of large scale surveys was felt to be prohibitive and therefore other ways to *'get a handle on what people are really thinking'* were felt to be necessary.

What constitutes good reliable social science evidence? How can we trust it? Comparison to medical research.

This theme was returned to several times in the interviews and in many ways came through in all of the other themes, that is, there was a fundamental and continued questioning of social sciences to show how robust are the findings from those

disciplines. Sampling was mentioned and also comparisons with medical research *'The other thing is... how... in medical science you can quite easily have a control group...'*. There was an interest in information on how to assess the quality of social sciences research. *'One of my limits is really understanding what we can reasonably expect in terms of results that will stand up to that public scrutiny, results that will be repeatable, results that will really delve into that level of understanding that is useful for understanding the whole range of policy questions'*

Comparison between quantitative and qualitative research

There was a clear understanding of what could be achieved with a quantitative survey but less understanding and therefore confidence in what might be achieved with a qualitative piece of work. It seems to be mainly about having a set of rules to evaluate the research processes with and that whilst those rules were understood for quantitative research they were not so well understood for qualitative work. Not having a framework in which to evaluate the research within makes it harder for that piece of work to be put forward as robust evidence for influencing policy.

Peoples behaviour as ultimately unpredictable and changeable and therefore unmeasurable

A further issue raised, again a frequent theme in discussions about social sciences research, is that the phenomena that are under analysis are unpredictable and changeable making it difficult for accurate measurement. *'I mean I think if you have been on the receiving end of a questionnaire you wonder whether any.....depending on the situation in which the interviewer catches you.... I think I would give a different answer each day'*. The idea that people act in an unpredictable and arbitrary manner and are all very different from each other is one that is often raised as a problem for social sciences research. However, there is research that shows how people can be grouped according to attitudes (e.g. Anable, 2005) and actions and that over time behaviours can be predictable and changed (e.g. Ajzen and Albarracín, 2007).

In discussing what they would like to know more about the issue of framing was raised. There was a sense of wanting to be confident that the questions asked are *'reasonable...'* and that *'whether we could get more out of the work by framing the questions differently....maybe whether we are asking the right questions or whether there is a right question to be asking?'*

Quality of research seems to be measured in terms of effectiveness and impact of that research on the policy area rather than in terms of research criteria such as validity or reliability.

Future of social sciences in SPD

It was felt that social sciences would play a central role within SPD in the future given the nature of policies.

'I'd be surprised if there are very many projects in SPD that don't have some element of the social science That is the nature of the policies.....It means we need to up our game on it, how we ask questions and how we interpret answers'

Analysis of the SPD projects

A list of past completed, currently active and possible future (planned) projects was compiled and then it was reviewed by the Theme Manager. Information on the projects was collated from the Defra website and for finished projects Technical Summaries were obtained where possible. A summary table with the projects listed is presented in Appendix 3.

In the SPD theme there have been twelve projects finished since 2000 and there are twelve projects currently ongoing or in planning. All the projects apart from one (which has been moved into the MAR theme) have or have had social sciences as a core part of the work. Given this the emphasis was on what sort of social sciences were used in the projects rather than if social sciences were part of the projects. Of the finished projects, in terms of the range of disciplines, they include economics, sociology, social psychology and planning with social research methods. Nine of the twelve are economics focussed: seven of those being around economic appraisal and the other two having sociology, health studies and social research input. There were two projects led by social psychology and planning respectively. A range of social research methods e.g. interviews, questionnaires, focus groups were used in at least half of the projects. In terms of projects that are interdisciplinary with physical science disciplines, there FD2009 Consistent Standards of Defence for Flood Cells which links economics, with hydrology and some sociology. Otherwise, interdisciplinarity is between different social science disciplines.

Of the projects in progress or planned there is a wider variety of disciplines covering sociology, social psychology, economics, institutional management, land use planning. Of those twelve, one is predominantly economics, one has economics with market research together with three that are based in sociology and social research. In terms interdisciplinarity there are three: one with economics, modelling and risk analysis (FD2601), one which links risk assessment with urban catchments (FD2603) and one which is spatial planning, risk analysis and social research. Finally, one was at the specification stage looking at the Water Framework Directive and flood management focussed on ecological issues.

Looking at the contractors used in the projects it can be seen that there are core of consultants used on the projects, some of them are the engineering consultancies who have great knowledge of flood risk management but less experience in the social sciences. One project that was focussed on risk communication and community participation was undertaken by an engineering consultancy (FD2007), with some limited experience of social research. Similarly with the Consistent Standards of Defence for flood cells project, whilst there was a social scientist engaged on the project the project was led by HR Wallingford, a physical science based consultancy. Another project looking at the evidence base for flood resilience which involves both a cost benefit analysis and research on the 'social and attitudinal barriers to the uptake of these measures' is led by Entec, another engineering based

consultancy but with considerable input from social scientists at Greenstreet Berman. The sense is that the social sciences, including economics are felt to be able to be covered as extensions to the large engineering consultancies who dominate in the other themes. The exception is MUFHRC who have pioneered an interdisciplinary approach to flood risk management, are involved in many of the projects and have considerable social science expertise beyond economics.

The focus on the larger engineering consultancies is not surprising in many ways as those are the companies that have expertise in flood risk management. It is really only since 2000 or so that expertise in flooding has been developed in a number of social science departments in the UK (e.g. University of Surrey, University of Lancaster, University of Manchester). As flooding has moved up the public agenda it has also moved up the social sciences research agenda. However, there is work in social sciences departments e.g. attitudes and behaviour, governance, risk perception, risk communication which whilst not directly focussed on flooding is readily transferable.

The way in which projects are developed was discussed with the Theme Manager and Champion. Projects come through a number of routes e.g. from policy questions, from previous research. Topics are discussed and then specifications are drawn up. The Theme Advisory Group is asked for ideas and has the opportunity to make proposals. However, most projects are initiated internally in the policy teams. The theme advisory group approves the lists of projects.

2.2 Modelling and Risk (MAR) Theme

2.2.1 Textual and thematic analysis of RO statements and workplans

The overall policy aim of the MAR Theme is to support Defra and the Environment Agency in their aims of managing and reducing risk effectively and efficiently to develop and deliver better risk assessment and management as needed by FCERM. Therefore the research is used to inform policy, practice and decision-making. The Programme vision for the MAR Theme is set out in the Rationale/Objectives (RO) Statement included as Appendix A of the Theme Work Plan (dated 11 October 2006).

According to the RO Statement (see Appendix 1 of this report, included in a separate volume), good science, new tools and improved data will be needed to assess current and future risks, to detect changes and trends, and to decide on the best way to manage risks taking into account future uncertainties. The MAR Theme aims to develop and promote a 'risk based' framework and the research will include the physical processes, environmental extremes, system responses, vulnerabilities and uncertainties. The baseline states that without the programme Defra/EA will fail to deliver flood risk management to the appropriate standards leading to unacceptable increased human and financial impacts and misallocation of investment.

Within both the workplan and the RO Statement there is no explicit mention of or the need for the use of particular disciplines to help address the objectives of the Theme.

However, the use of social science is implicit in a number of ways, not least in the mentioning of social and economic processes and impacts and through reference to the use of non-structural responses. In particular, it is stated that the Theme will develop tools, methods and models to improve understanding of *receptors* of flood and coastal erosion risk; these receptors include people.

A number of issues mentioned in the documents can be framed in terms of socio-technical or techno-economic objectives or benefits. Examples of these are given below with references or allusions to social science input highlighted in italics. For example, a key aim of MAR research is to reduce the threat to *people* and property and deliver the greatest environmental, *social and economic benefit*, consistent with the Government's sustainable development principles. The RO states that flood and coastal risk management will need to be *economically*, environmentally and *socially* sound, taking into account both the probability and the consequences of flooding. Solutions will be developed from *integrated portfolios* of both structural and *non-structural responses*.

The Work Plan itself is more of a vision than a list of specific projects for the next five years, and needs to remain responsive to changes in the needs of Defra/EA and to the opportunities provided in advances in science and technology. This is to be achieved by an annual process of consultation with the Theme Advisory Group and stakeholders, and a process of identifying and prioritising new or existing R&D. The specific aims of the MAR Theme as outlined in the workplan (p. 1-2) are as follows, with those aspects which may include social science input again highlighted or added in italics. Only the fourth aim appears to have no scope for social science input.

- To assist Defra/Environment Agency (EA) to implement in a sustainable and cost-effective way the policies set out in 'Making Space for Water' and the Agency's 'Strategy for Flood Risk Management' by developing more integrated FCERM models and tools. [*integration of physical and social sciences within the tools and methods*]
- To do this by allowing Defra/EA to understand the interaction between policies, strategies and delivery of flood and coastal erosion risk management including *land use planning* within the context of the Water Framework Directive, through the development of open-interface multi-purpose tools.
- To increase the understanding of physical, *economic and social* flood and coastal erosion processes, risks and uncertainties and the impact on them of climatic, *socio-economic* and environmental change.
- To enable improved flood and coastal erosion risk management by continuing to develop system-based tools and predictive models of catchment, urban, estuarial and coastal areas for assessment of risk and responses.
- In particular to facilitate the development of integrated portfolios of structural and *non-structural* measures in an evidence-based, transparent and

demonstrable way by developing consistent modelling, appraisal and decision support, and **risk communication** tools.

- To promote the development and use of generic **risk and uncertainty modelling techniques** and to support other Themes in their specific topic areas.

A logical framework based on three sub-themes is also proposed. The themes are outlined below with aspects of social science relevance again highlighted:

- Cross cutting risk based knowledge and methods – **to produce data, information, knowledge and software to develop tools, techniques, frameworks and models to support decision-making and delivery of all aspects of FCERM** – Example topics in sub-theme include: climate change and extremes; methods for sustainability, risk, reliability and uncertainty models. To develop methods for **risk communication** aimed at encouraging **integrated risk management** using structural and **non-structural measures**.
- Spatially-base processes and models – to improve understanding and model **the social and economic processes** of flooding and coastal erosion to help manage risk in a more sustainable way - **resilience is a topic in this sub-theme as is other non-structural approaches**.
- Integrated system (catchment and coastal) models and applications to manage FCER at all levels. Topics include tools for national risk assessment, **catchment level strategic planning, scheme appraisal**, asset and **flood incident management**; tools for risk and hazard mapping.

These themes are also illustrated in Figure 2.1, taken from the workplan. However, the social and economic risk assessment and communication tools appear to come late into the overall workplan I in 2009/2010 (also discussed in the interviews below).

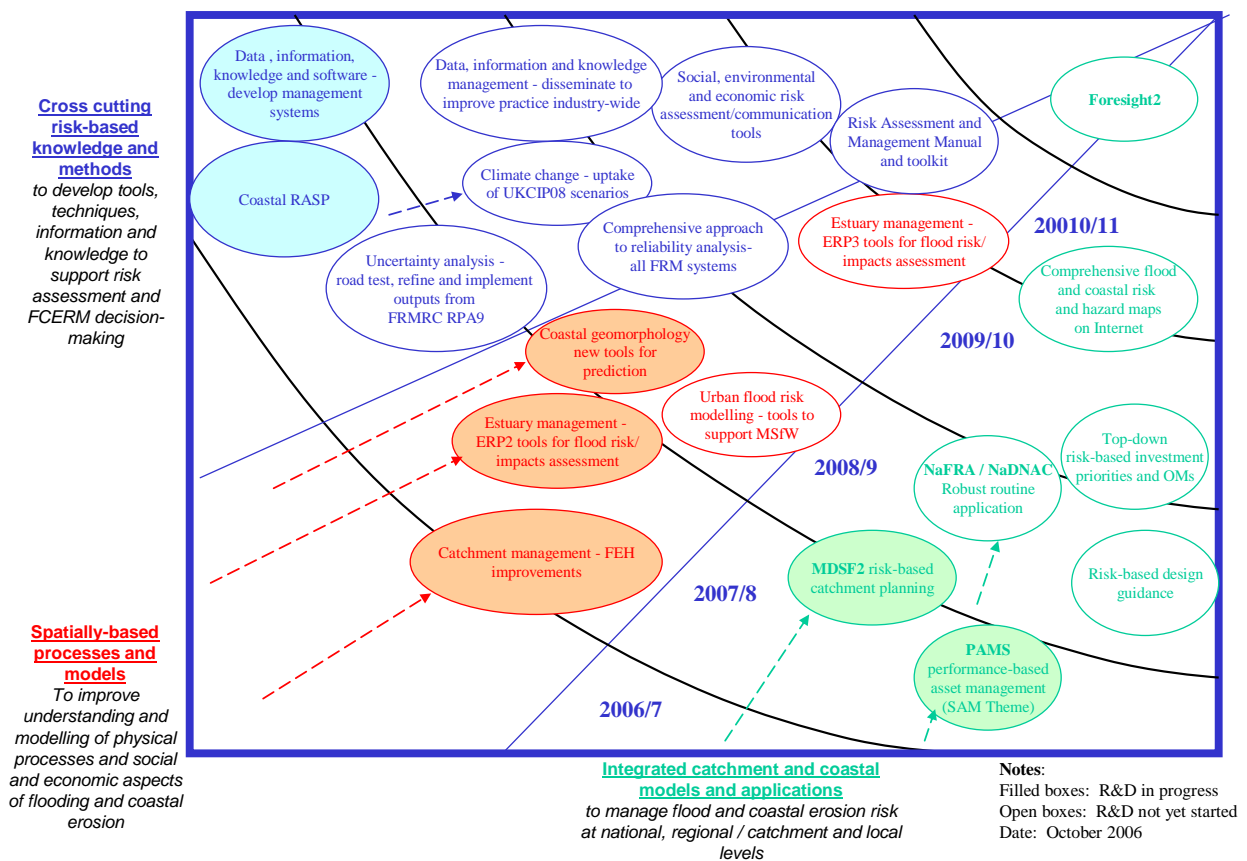


Figure 2.1: Strategic direction of MAR Theme R&D: timescale and framework based on the three sub-themes

Thus hooks for interdisciplinary and social science working therefore exist relating to impacts and consequences, socio-economic modelling etc. which are implicit in the objectives/aims of the Theme and sub-themes as follows:

- *communication with those involved particularly on understanding tolerable risk;*
- *better decision-making under uncertainty;*
- *development of methodologies to assess social environmental and economic aspects of risk;*
- *public availability of tools for communication of risk and participative evaluation of risk management options (with IMCE Theme);*
- *understanding changing perceptions of risk and expectations for risk reduction;*
- *developing methodologies to facilitate and encourage sustainable FCERM;*
- *understanding and assessing consequences to the receptors by flooding and erosion;*
- *understanding and assessing how social and economic factors affect sustainability of catchment management;*
- *integrating physical, social, economic and environmental aspects of coastal and estuarial management;*

- better integration of FCERM and *spatial planning*;
- linking tools for other policy areas e.g. *Water Framework Directive, integrated water management*.

In addition, the RO Statement notes the importance of working with other R&D themes and funders, particularly on the cross-cutting research areas outlined above. One area mentioned that is of relevance to social science is that of *communities*. It is stated that the Incident Management and Community Engagement (IMCE) Theme will conduct research into *social processes and responses* to flood and coastal risk, while MAR will incorporate *social interests* into risk models to inform and support decision-makers. Social science approaches will therefore be crucial to help understand and model these social interests. In the Work Plan there is mention of a Theme Interaction Matrix in Appendix B, however there was no Appendix B in the version received and, on checking, this has not yet been produced. It would however, be useful to see how the themes overlap and fit together.

The science to support the MAR objectives is mentioned as being practical and based on the best available data and information, and will give ‘the most appropriate mathematical and numerical representations of the problem or solution’. The types of representations and information mentioned are numerical and mathematical. According to the Theme Champion and Manager much emphasis is placed on MAR research being predominantly quantitative focussing on probabilities and impacts. Many groups of beneficiaries for the research are listed in the documents. These include first and foremost the people, communities and businesses in or adjacent to areas of flood risk. Other beneficiary groups include government departments (including the Environment Agency and Defra policy and process developers and Environment Agency operational teams), Local Authorities, water companies and Internal Drainage Boards, emergency services/responders, the financial services industry, research councils, organisations and other research projects. By implication, this would necessitate understanding the different groups and their needs in order to assess how they may benefit from the research.

All of the above will inevitably require the use of social science disciplines and approaches along with other technical and natural science approaches. In particular, where relevant, inter, multi and trans-disciplinary approaches will be required to deliver the Theme’s aims and objectives.

Some of these issues were discussed in more detail in the interviews with the Theme Manager and Champion.

2.2.2 Findings from interviews with MAR Theme Manager and Champion

Aims and objectives and key questions for MAR R&D

Many of the statements issued in the RO Statement and workplan were reiterated during the interviews with the MAR Theme Manager and Champion. For example, when asked what were the main aims and objectives for R&D projects related to the

Theme and what are the key questions, or type of questions, to which the Theme is seeking answers, the main response was that the MAR focus is on business and policy, and in tools, techniques and knowledge being delivered to improve business.

MAR research is therefore focussed on end use, on useable science and on finding answers to key questions. To achieve this it looks at the immediate and longer-term needs, as both need to be addressed. Three types of research were outlined: 'Blue Skies', Proof of Concept, and Targeted. The latter is what the FCERM R&D Programme is the most keen on, but with links to Proof of Concept research. For people to accept fundamental or Blue Skies research they need proof of concept first. There was some concern that Blue Skies research may end up going down '*blind alleys*'. It was suggested that there is a need to talk in terms of specifics rather than at a general level. MAR needs to define what the specific questions are they are seeking to answer, then if social science can help to answer these questions it should be encouraged to do so.

The value of social science research for FCERM

Overall, social science research was said to be an essential area that the MAR Theme needs to move into to achieve some of its objectives, particularly on quantifying impacts. This confirms the analyses of the RO Statement and workplan which indicates the need to include more social science in future R&D. One way in which the social sciences were thought to have a lot to contribute was in finding a way to translate qualitative statements into quantitative tools. Another way in which social science could contribute was in the area of risk communication, as well as on issues such as resilience and acceptability. A further area cited relates to the loss of understanding of the natural world and nature e.g. rivers and how they function.

A key area where social science was identified as being able to make an input into MAR's work is through social modelling. A Modelling Strategy for Flood Risk Management is currently being drafted which at present focusses 99% of modelling on hydrology and hydraulics. Social science modelling is also needed and will have a role in the future, however, at present it is not possible to specify how much or when by.

It was also suggested that the use of the social sciences might be able to help refine understanding of non-structural measures and some aspects of vulnerability, for example in National Flood Risk Assessment. MAR seeks to understand the probabilities while the IMCE Theme focusses more on the consequences – both were said to be needed to better understand risk. It was also stated that people may (intentionally or unintentionally) also be the source of flooding and not just the receptors e.g. in urban land use. This is another aspect that MAR research needs to explore further. Other issues identified were uncertainty and planning both of which require social science input.

Although it was stated that some other MAR Theme Advisory Group members also believe that social science has a role to play, this does not apply to all members. By some, social science is seen as '*woolly*', for example by '*producing 5,000 pages that come up with nothing*'.

All the social science disciplines were seen to be relevant to the MAR Theme, as was the interplay between them. A combined approach is thought to be needed. The Theme Manager acknowledged the overlap between the different social science disciplines and welcomed the idea of multi-disciplinary research. Perception was mentioned as a key area (using psychology) that is relevant to the Theme. Moreover, all social science approaches and methods were also considered to be relevant, but it was again emphasised that any research needs to be evidence-based and that was interpreted as referring to largely quantitative research. However, there was agreement that there is also a role for qualitative approaches where they may inform the research and lead to better understanding.

According to the Theme Manager and Champion, it is a question of using the best skills and approaches at hand to address the questions set. Some projects will probably never use social science e.g. some software protocols, where others will. What will not happen is, for example, one particular project being commissioned because it is a sociology or psychology project.

However, it was suggested that the input of the social sciences into strategic policy level research may be limited in the MAR Theme, as the Theme has to work within specific boundaries, e.g. Defra/EA guidance and legislative frameworks which act as a constraint on research. These included the direction of the SPD Theme, which requires that policy has to be evidenced-based and needs to justify that evidence and having to use economic justification for expenditure on projects and the reliance on numbers and quantifying everything. It was questioned whether the social sciences can contribute quantitative results which can be used, but it was also suggested that the qualitative should compliment the quantitative. At the applied rather than policy level, however, it was thought that there is perhaps more scope for social science input into projects.

In the next five to ten years, areas mentioned that the MAR Theme would like to understand better were the drivers, pressures, receptors, sources and pathways as well as a better understanding of why people behave as they do. Other areas mentioned that social sciences could contribute to in the future included options appraisal, planning, communications and 'anything involving people'. These link back to the three MAR sub-themes outlined earlier. The project on Broad Scale Modelling (FD2118) was highlighted as it is a 5-10 year vision for directing research linked to 'Making Space for Water' modelling needs, and should provide a framework for subsequent research.

The issue was raised by the researcher of socio-economic aspects of research being completed late in projects (e.g. the ERP research). An example was given from Figure 1 in the workplan (see section above) which shows the strategic destination of the MAR Theme. However, it was pointed out that the Broad Scale Modelling project (which included social scientists) had scoped this plan and indicated the order and time schedule for the programme.

However, one suggestion as to why socio-economic aspects of research often came late in projects was that it was often for practical reasons and that the technical

aspects of projects were often a follow-on from previous projects and were therefore a logical progression. It was also acknowledged that this could be due to the legacy effect in terms of the largely technical focus of the R&D and the overall culture of the R&D Programme. It was also suggested that it is perhaps easier to conduct technical projects as these reflect the background of those commissioning the research and also that there might be an idea that social science projects will hold up other '*more pressing projects where answers are needed sooner rather than later*'. It was suggested that the Environment Agency seem to separate out social, economic and environmental projects and that there are few multi-disciplinary projects. However, it was also restated that there are links across the four Themes and that, for example, the MAR Theme will take an interest in IMCE Theme projects and vice versa.

Understanding of the social sciences and social science research

Although coming from essentially engineering or physical science backgrounds, both the MAR Theme Manager and Champion expressed some understanding of the social sciences and social science research, although this was extremely limited in some areas. This knowledge and understanding had been a result of either experience of social science through their own studies (Manager), through working with social scientists (Manager and Champion) or through some experience of social science projects (Manager). The Theme Manager emphasised that when working with people he always asked whether the techniques proposed were appropriate, socially acceptable and economically affordable, and if there was community participation. The Manager was aware of the '*conceptual gap between people and designers/planners*'.

Another issue raised was that of '*language*'. It was suggested that social scientists do not report their findings in a way that non social scientists understand or which is usable by the practitioners in their day to day decision-making. However, it was also acknowledged that the MAR TAG members may also be constrained by their own disciplinary languages.

It was suggested that the situation facing MAR is particularly complex in that although people need simple answers to their research questions, the research process that results in giving the answers is often complex. Therefore the issues are not simple but the user application or procedure to produce answers does need to be simple, or at least be reported simply e.g. simple depth damage curves or look-up tables, maps etc.

The Theme Manager suggested that a bridge was needed between quantitative and qualitative science. He suggested that there are two 'camps' among social scientists. The first camp uses highly complex statistically oriented methods which produces robust quantitative results, while the other camp uses more 'simple' anecdotal evidence which produces qualitative results.

Another issue relating to the use of social science was that of a sufficient social science skills-base within Defra/EA for staff to manage any future projects that incorporate a social science element. At present it was suggested that there is not a

sufficient skills base. This was largely said to be due to resource problems across all aspects of manpower within the R&D programme. It was remarked that projects have had to be put on hold as there is not enough capacity of internal staff to manage them. The Environment Agency Social Policy team cannot be asked to manage every project that has a social element, although they can be used to advise/guide on projects.

It was also stated that it is not just about managing projects but also about the project executive and business user roles which need to ensure that the projects address the questions set. Moreover, for policy work and client project management it was stated that there is a reluctance to bring in '*outsiders*' to work on projects. For training purposes R&D often relies on contractors. Rather than employing specialists within the Environment Agency/Defra, consultants might be used to trial and test tools and there may be money to train people in the use of certain tools e.g. Modelling and Decision Support Framework. Thus the onus is currently on the social scientists working on the projects to say how to answer the questions rather than training people within the Environment Agency/Defra.

As far as a strategy for social science is concerned, both the Theme Manager and Champion could see the potential use of social science research within the Theme but did not have a clear understanding of why there had to be a separate strategy for social science as opposed to a general strategy for all sciences, including social science and multi or cross-disciplinary work as a key part. There was concern about the ethos of a social science strategy with a suggestion that it will need to be sold as a tool to improve flood risk science. Thus, it was felt that social science needs to be integrated into the research programme along with other science and that there is a role for it along with other disciplines.

Key criteria by which MAR projects are judged to have been successful

To be successful MAR projects obviously need to address their objectives and deliver the benefits identified. The main mechanism for judging if projects have been successful is through 'benefits tracking'. Key questions asked will include whether the project has identified any knowledge gaps or developed a knowledge base, or what are the key outcomes for policy and/or process operations? Other questions will focus on whether it has led to cost savings (costs being both tangible and intangible) or sustainability. It was also emphasised that individual projects need to link back to the programme objectives. This might mean that some research projects may simply aim to identify or lead to further research, rather than producing tools or techniques themselves. The MAR Theme are always looking for the best expertise to address the issues at hand, this expertise may well come from the social sciences. The Flood Risk to People project (HR Wallingford, 2003; 2005) was mentioned as one successful example of a project where social science had made a contribution.

Constraints faced in trying to achieve aims and objectives

Limited funding and resources were given as continuing constraints for the Theme's R&D programme. Another problem highlighted in the discussions was that the Theme always needs to be thinking ahead towards tomorrow. One question to ask is

what are the issues going to be in five years time and what needs to be done to start thinking about them now? A related problem is that research results cannot be produced overnight, some research requires the need for data collection which takes a long time, therefore it needs to be planned and commissioned before the results are needed. It was felt that this needs the Theme to be always one step ahead of the game.

Analysis of MAR projects

A list of past completed, currently active and possible future (planned) projects was received from the Theme Manager. These are shown in Appendix 2.

In analysing the themes of these projects it can be seen that the majority are natural science or technical/engineering projects which do not have a role for social science input. Of the 48 projects listed 71% had no social science input, 25% had a small social science input.

Two percent (one project) have equal amount of social science and 2% have a central role. The former is a proposed/planned project said to be largely social science focussed: FDI(07)10 – Assessment of impacts of non-structural measures and public resilience. The latter was FDI(07)06 – Methodology to understand and assess customers preferences and the nature of social choices in flood risk management for CFMPs and SMPs and it appears to suggest a totally social science approach, in this case economics. There do not appear to have been any MAR projects that have totally been based on the use of social science approaches. One proposed project on methodology and modelling to understand and assess public preferences, choices and willingness to participation in flood risk management has currently been shelved due to lack of finance, but remains a potential future project.

Where readily available, information was given on which contractors conducted the research, which core areas of social science (if applicable) were used along with details of the methodologies. However, much of the spreadsheet cells remain empty as the Theme Manager was not available during some of the discussions to answer questions and did not have the time to provide all the relevant details. The Theme Champion (only being in post for a short time) did not have a detailed knowledge of all past projects, and was therefore not aware of who had initiated or developed those projects which did have a social science element.

The majority of the projects were carried out by engineering consultancies or academic departments with similar backgrounds and technical skills. It can be suggested that where some social science methods/approaches had been used in certain projects (e.g. FD2320 - stakeholder consultation, workshops) that these were not necessarily run by social scientists or using social science 'thinking' (e.g. they were carried out by engineering consultancies who tend not to employ many social scientists). One or two projects appeared to have involved expert judgement by social scientists rather than social science methods/approaches (e.g. SC050028). There was some discussion of how decisions are made about which projects to fund. The Theme Advisory Group management teams shortlist the projects and it is the Champions' role to sell it to the business (users). The Programme Advisory Board

(PAB) appraises projects at the higher level for strategic needs and gives approval to spend. There is then a prioritisation process to decide which projects need to be completed first and which can be held until later. The MAR Management Team and project Managers decide this.

Summary

Analysis of the MAR workplan, RO Statement and interviews highlights, and implicitly implies, a growing need for the use of social science input in the future if the objectives of the Theme's R&D are to be met. However, at present there is still a strong emphasis on technical and natural science disciplines within the research programme. There also appear to be some lack of clarity over the type of research that the social sciences can produce (i.e. robust and evidence based), whether economics is included as a social science, and that social science projects take longer to produce results.

If social science is to have a greater future role within the MAR R&D Programme, the Theme Champions and Manager will need to play a key role in persuading the PAB, business users and Management Teams of the benefits that could be realised from both social sciences and multi-disciplinary research.

2.3 Incident Management and Community engagement (IMCE) Theme

2.3.1 Textual and thematic analysis of RO statements and workplan

The IMCE workplan (dated August 2006) defines Incident Management and Community Engagement as including a number of different elements. These elements can be divided into two main groups for the purpose of this report, those that have a techno-engineering focus (i and ii), and those which have a socio-technical focus (iii to v):

- i) Monitoring and detection of weather conditions by field instrumentation, including the measurement and forecasting of rainfall by the Met Office/EA national weather radar network and tide levels by the POL/Met Office Storm Tide Forecasting Service;
- ii) Forecasting future river levels and flows and onshore wave and tide levels by modelling;
- iii) Formulating and issuing flood warnings to vulnerable locations using databases of at-risk property and assets;
- iv) Response to flooding by individuals and agencies to minimise the impact of events;
- v) Post-event recording and analysis.

The aim of the Theme's R&D programme is to reflect the business needs of the Environment Agency over the next ten years and to develop tools and guidance to support those needs. The RO Statement sets out the Theme Vision, policy

objectives and their relevance to Defra and Environment Agency business needs, also taking into account other drivers of flood incident management. The IMCE Vision is to enable the Environment Agency to meet future performance targets for flood incident management and community response to flood events. The overall objective is:

'to help reduce the consequences of flooding through the application of sound science in developing effective flood incident management systems.'

Specific objectives are listed under three headings:

1. Organisation – system operation, uncertainty handling, coverage, training and support
2. Technical – best practice models and techniques
3. External interfaces – targeting of and response to warnings, vulnerable groups, building flood resilient communities, improving inter-agency planning and response, and improved methods of warning dissemination.

The last of these objectives has the greatest potential opportunity for social science input. In the RO Statement the external interfaces are described in more detail. It is stated that the programme will produce guidance and improved methods so that people in flood risk areas will receive clear information aimed at their particular needs and will know how to act when faced with flood information and will take appropriate action to mitigate losses, damage and risk to life. The aim is also to improve public awareness.

These objectives are further identified in the IMCE workplan which sets out five major new initiatives within the programme over the next five years:

1. Risk based flood incident management
2. Community planning and response
3. Flooding risks from other sources e.g. non-river flooding
4. Information requirements
5. Measuring system performance

The first two initiatives probably have the most relevance for social science input, as highlighted in italics in the following text. The first initiative involves development of a risk based flood incident management system to allow warnings to be issued on the basis of the consequences of flooding, tailoring the service to the requirements of end users and permitting more targeted warnings to be given, for different groups, types of flooding, catchment characteristics and other parameters. The second initiative is influenced by recent developments in Defra and Environment Agency policies which place increasing emphasis on social dimensions e.g. health and the environment, environmental inequalities, regeneration, liveability and environmental citizenship. This highlights the diverse social and health impacts of flooding and the

range of institutional and social responses required to manage these and other impacts effectively.

Moreover, the workplan states that different communities both respond to flood warnings, and to flooding, in different ways (some being more vulnerable than others) and require effective responses and co-ordination between a range of institutions (both the Agency and its partners) and the communities themselves. The third initiative will take up the research identified in Making Space for Water (see below) Groundwater and Urban situations. Groundwater flooding can be very long lasting and cause considerable long-term disruption of people's lives. A good knowledge of the causes and properties of these types of flooding will enable the Environment Agency to give the people affected good information with which to plan their response.

Work will also continue on existing areas of research that deal with improving existing systems and methods. As one of the four new themes within the FCERM R&C Programme, the IMCE Theme inherited the work of the former Flood Forecasting and Warning Theme with some projects from other predecessor themes. The R&D therefore aims to address both operational issues (i.e. those having an immediate bearing on improving efficiency and effectiveness) and strategic issues (i.e. those aimed at developing new techniques and improved systems and methods). As with MAR, the Theme will not deal with long term, basic 'Blue Skies' research but where this is not covered by other theme areas it will aim to influence programmes promoted by research councils such as EPSRC and NERC (with whom the Theme maintain links) to address any relevant issues. It is also noted in the Work Plan that links will be developed with appropriate ESRC programmes through the proposed Project Area Steering Group which is planned to cover social and community engagement issues. However, as of July 2007 these groups had not been organised. The Theme also maintains links with other scientific and technical projects which support Environment Agency business needs, such as the EPSRC Flood Risk Management Research Consortium, the NERC Flood Risk from Extreme Events programmes and the EC FLOODsite project.

There is strong emphasis in the workplan of linkages with the other three R&D Themes. An additional key link for the Theme is with the 'Making Space for Water' programme of work which is responsible for taking forward the new strategy on flood and coastal erosion risk management in England. Several projects within the programme that can be identified as of relevance to the IMCE Theme and which have potential for social science input: SD6: Stakeholder and Community Engagement; RF2: Encouraging Uptake of Resilience Measures; RF5: Expanding Flood Warnings. RF8: and Emergency Planning Response and Resilience. The overall key beneficiary groups from the IMCE research listed in the RO Statement are that of the people, communities and businesses in or adjacent to areas of flood risk. Other beneficiary groups who are mentioned in more detail in the specific objectives include Environment Agency flood risk management and flood incident management Managers and teams as well as operational, marketing and communications and public awareness campaign teams. Other beneficiaries include Local Authorities and emergency services/responders.

As with the MAR Theme, the contribution of social science is therefore implicit within both the IMCE Work Plan and the RO Statement in many areas of the research, as flood incident management is essentially about people. The RO Statement also explicitly highlights a recent overview of the social aspects of flood risk management¹⁰:

'The Environment Agency recently undertook a review of the social aspects of flood risk management, including the contribution of social science to FCERM science. A significant finding and recommendation from this review was that while there is already quite a range of social science projects being carried out within the DEFRA/ Environment Agency joint research programme, there is no overall strategy for why these projects have been commissioned. Linked to this, whilst there is a sense that social science is useful for FRM especially where technological solutions are seen to be failing, most staff (in both Defra and the Environment Agency) have little or no knowledge of social science research, methods and practice. As a result, social science appears to mean many different things to different people. This led to a recommendation to develop a clear vision of the role of social science research within the Defra/ Environment Agency joint research programme. As the key user of social science information, this programme will play a major part in delivering this recommendation.' (RO statement, rationale)

A number of other internal and external drivers of research are also listed in the RO Statement. These drivers include key strategies and publications such as the Flood Warning Investment Strategy, the EA's Strategy for Flood Risk Management, Making Space for Water, Making it Happen, and the Foresight Future Flooding report. Other drivers include the 2004 Civil Contingencies Act, the emerging UK science agenda and EU Framework VI research programmes.

2.3.2 Findings from interviews with IMCE Theme Manager and Champion

Aims and objectives and key questions for IMCE R&D

The main aim of the IMCE Theme as stated by the Theme Champion and Manager is in helping to manage and reduce the consequences of flooding to people through whatever means that allow the Environment Agency to do that. In other words, the objective is to achieve research results that give the Environment Agency an 'edge' and that would allow them to do more for less. Another aim would be to reduce the negative impacts on the environment as well as people, plus to reduce flood effects by means other than hard defences and where the research results produce ways of measuring impacts or understanding the impacts on people in order to manage them better.

They suggested that at present the largest amount of R&D expenditure is spent in trying to understand the different systems. However, it was felt that there is a need to be able to predict behaviour of a natural system in order to provide better information

¹⁰ Twigger-Ross, C (2005) Improving the contribution of social science to the Flood Risk Management programme

to people so that they can do things differently. They suggested that key social science questions would be: how do we get people to do things differently? Why do people do the things the way that they do? What things should they do?

The value of social science research for IMCE Theme and FCERM

One solution to answering some of the IMCE questions, it was suggested, can be by using interdisciplinary research including social science approaches. It was felt that it is necessary to use whatever discipline will give the answers to the questions. Further, results must tell the story rather than the methods used. If the results from social science research can give the Environment Agency an edge then it was to be welcomed by the Theme Manager and champion, but if it was not felt to be doing that spending money on social sciences would be questioned.

Moreover, it was felt that social science needs to be used at all levels of R&D, from strategic to local and more interdisciplinary working was said to be needed. The interviewees suggested that social science has the ability to provide compelling stories which provide powerful evidence along with numbers, which are also compelling. According to the Theme Champion, there is a need to change how incidents are managed; management should be based on the outcome to be achieved and it needs to be based on people. Social science is critical in contributing to this e.g. in probabilistic forecasting and radar it is about developing a project that works for people. It was suggested that IMCE needs to focus on community engagement and what happens before during and after flooding. The 'after' element needs to be more structured e.g. post-flood reporting, and how social science has been brought in. An example from Boscastle was given whereby people's flood records were collected and this was useful in helping people through the experience.

There was a suggestion for a need to look at proper strategies to embed this type of approach into work practice, but this is not seen as the role of the Environment Agency.

Both the Theme Manager and Champion were hopeful that social science research will be accepted and become a part of how the R&D Themes work. However, it was suggested that there are a number of 'social science sceptics' who question the value of social science research. There was a perception among some staff within Defra and the Environment Agency that social scientists need to change and to use a different language, to frame things in such a way that non social scientists can understand them, in other words to 'mainstream'. This particularly refers to written reports which should be in simple, open style e.g. as used in publications such as the Guardian or New Scientist, and not 'full of jargon'. It was emphasised that simple answers are needed to research questions. It was felt that it is poor science if it does not communicate the outcome effectively. Social science reports were thought to be was '*too wordy*' with unclear objectives. Again, there was a suggestion that social science projects 'take forever' and that quicker answers are needed.

It was suggested that projects should influence in some way what the Environment Agency does, providing knowledge and tools to help them do this. IMCE projects were seen as benefiting from being informed by people's needs, wants and hopes so

that the theme could develop a longer term vision. Up to now it was suggested that the questions have been asked from the driving end and not the receiving end i.e. how can flood warnings be disseminated more quickly? Who should the warnings target?. It was felt that the Environment Agency has not asked why people don't respond to warnings or why some people do not bother while others take actions. Further, it was suggested that until these questions are answered the Environment Agency are not going to improve the service at all. It was felt that it is easy to add a new widget to something, but often social science results are less easy to understand and implement. On reflection it was suggested that the Environment Agency perhaps needs to be better at putting the message across and understanding the people's needs.

The key story for IMCE was considered to be about managing the consequences and impacts of flooding on people. Flooding, it was emphasised, is about people and not water and technology, about helping people to live with flooding more comfortably and to link this with how to adapt to climate change. It was felt that there is a need to understand what people want, how they behave and react to a whole range of scenarios, also to understand the different perceptions before and after the flood for those at risk. It is about understanding the people aspects whilst looking at the technical tools to deliver these.

It was acknowledged that social science was '*left out of the loop*' in the past but that there are lots of social science strands now coming up in all sorts of projects e.g. Making Space for Water. It was also suggested that there is a problem in the way that research is commissioned. Contractors ask certain questions and produce a report about what they think. They are not asked how that knowledge should then be applied in order to better adapt to peoples behaviour. One suggestion was for a strategic approach to have the best outcome for people, and that each project should start from that point. Floodline Warnings Direct was cited as a classic example of 'Look what we can do' rather than 'Look what people need'. There was felt to be a role for social science there in facilitating people to ask the right questions. The questions people ask the Theme Champion are 'How can I get people to do things?', but they are coming at the issue from 'Why can't I get FWD to do this?' or 'How do I develop a more effective forecast?' when it is felt to be about how to get people to do things.

The Theme Manager also felt that it is about how people assess risks within their lives and what measures they are prepared to take to mitigate those risks. It was suggested that Defra and the Environment Agency are trying to move the technical side forwards before having the people side issues to plug into it. 'People ask why are we developing the technology? Well, it is because we don't know enough to do anything else'. Thus, it was suggested that the suggestions from this current project therefore need to be wide ranging.

Understanding of the social sciences and social science research

Both the Theme Manager and Champion felt that they had a basic understanding of what social science could offer but they did not have any in-depth knowledge of specific social sciences. Moreover, neither had enough knowledge of social science

to know if the social science input in any of the projects could have been improved. There was a suggestion that it was not necessary for them to understand the details of social science methods and approaches, only enough to know if they would help provide answers where necessary. It was also suggested that by not being an expert it is possible to ask basic questions. However, it was acknowledged that it would be useful to know about practical examples and applications of where social science research has resulted in specific benefits.

It was also acknowledged that some basic understanding of the social sciences would be useful in order to ensure that the right people are commissioned to work on the projects to address the issues at hand. There was a general feeling that there are not enough staff working within Defra and the Environment Agency who have the necessary social science background. Therefore a general project manager whose job it is to get the work completed on time would not necessarily need to know about social sciences, however someone on the project board would have to be able to quality assure the work. At present those on the boards do not have the right expertise.

A way of addressing this was suggested in the form of simple 'this is how you do it' guidance, including a clear implementation route and products. However, it was stated that this should cover all science and not just the social sciences. All scientists need to deliver good results that fit the project specifications and aims. It was acknowledged that this is not going to happen overnight.

Regarding training of staff to increase capacity in social science, it was suggested that on the Theme Advisory Groups there is freedom to bring in anyone who is deemed necessary to get the job done and could best guide the project. The TAG is the strategic steer only and is not there to provide detailed quality control. One suggestion was that all the TAG members should get together to agree on a social science approach as this would help in the ownership of the end product.

When asked about views on the need for a social science strategy for R&D separate from a strategy for all sciences it was suggested that if people are asking why there needs to be a separate social science strategy then there is definitely a need for such a strategy. However, it was also stated that nobody asks if a modelling strategy is needed or not.

Key criteria by which IMCE projects are judged to have been successful

Any research results should address the project specifications and answer the questions set. It was acknowledged that in the past the project specifications may not have asked the right questions and that perhaps past research questions had been too rigid. One suggestion of how social science research could have helped inform the Environment Agency prior to providing a new flood warnings service was to ask what type of system people wanted rather than providing Floodline Warnings Direct without any consultation. It was suggested that in flood warnings it is in knowing 'how people's minds work' that is important. One other project mentioned that could have benefited from social science input was SC040034 Local FW Dissemination trial. This is a community-based project which could not find a

community to trial the new warnings technology that had been developed. A community was finally found which agreed to take part in the trial which is now going ahead.

Building Trust with Communities was thought to be a good example of how social science can benefit research and a number of the Making Space for Water projects (such as adaptation to climate change) were also said to be good examples of the use of social science. The Humber Estuary Flood Risk Management Strategy was a further example cited of good community engagement. However, interestingly all these projects have been carried out outside of the R&D programme.

Evaluation of projects was said not to be undertaken in any structured way. Benefit charts may be completed for projects, however there is no systematic social appraisal of R&D or a proper audit. One suggestion for a helpful tool could be a systematic social appraisal of R&D to examine the impacts on or benefits to people of projects. The Environment Agency already has a social appraisal tool that could be used for this. A further problem raised was that there is not currently any social science leadership group or group which focusses on social science, although the IMCE Theme is being promoted as the leader in people research. An analogy was made between social science now and how biodiversity was first perceived years ago. Often projects included a small element on biodiversity but it was never the main emphasis of the project and it was suggested that social science is similar. It was suggested that perhaps similar approaches/systems need to be taken/used as were used in order to get biodiversity accepted. Biodiversity is now said to be dealt with as a training issue, as an appraisal issue and a 'how we do things around here' type of issue.

Constraints faced in trying to achieve aims and objectives

One constraint identified in trying to achieve the Theme aims and objectives was the problem of practical application of research results. 'Blue skies' research (suggested such as that funded by the ESRC) is not seen to be practical and regarded as too academic, not about getting involved in the real world and solving real world problems. It was suggested that simple tools that people can use are needed. Therefore, persuading people of the benefits of social science research was said to be problematic. Defra and the EA want to see robust, hard, usable results and practical applications. However, it was acknowledged that the '*engineering culture*' is a problem, whereby people do not think through the issues properly and therefore do not think about what might answer their questions (or raise other questions).

Analysis of IMCE projects

A list of past completed, currently active and possible future (planned) projects was received from the Theme Manager and is included in Appendix 3. It was stated that historically there was a split and projects were either technical or social science; the numbering scheme for projects is evidence of this, but the Theme is now deliberately trying to avoid doing that. Some projects will be totally social science or technical but others will overlap. However, there was also no conscious decision to have social science in the IMCE Theme above other Themes.

Of the 49 projects listed 66% had no social science input, 8% had a small social science input, and 4% had a largely social science input. However, just under a quarter of projects (21%) were totally social science-based projects. The majority of projects were undertaken by engineering and technical consultancies or academic departments within universities. The social science projects were carried out by social scientists based in universities or by independent consultancies. These projects have employed a range of social science approaches from oral history and diary analysis to more general social surveys, workshops and focus groups.

The development of proposals for the social science projects had largely been carried out by the Water Management Marketing and Communications Team at the Environment Agency who could then use the research results to feed into their awareness campaigns or for better targeting of flood warnings. There had been no problems in getting these projects approved as the research was seen as being a priority at the time.

Summary

There is therefore great potential for social science input into the IMCE Theme's R&D, and support for that input from the Theme Champion and manager, not least in providing greater understanding of the communities at risk of flooding, particularly the so-called vulnerable groups, and their respective needs, preferences, perceptions and behaviours. However, social sciences research itself was viewed with some criticism e.g. in it not being simple, robust, and taking too long which was seen as an obstacle to its wider use and influence.

2.4 Sustainable Asset Management (SAM) Theme

2.4.1 Textual and thematic analysis of RO statements and workplan

As with the previous themes the RO statement and the workplan (included in Appendix 1) for the SAM theme provides the steer for the research within that theme. Both the RO statement and workplan are presented in Appendix 1.

The vision clearly states the change in thinking and practice that is required in order for flood risk management to adapt to the increased threat of flooding as a consequence of climate change. The vision makes it very clear that the SAM theme will reflect the move from 'defending to managing floods'. This is reiterated in the rationale. In addition, there is a clearly risk based approach emphasised mainly in the rationale:

'Flood Risk Management has adopted the Source-Pathway-Receptor model for our risk based approach.'

Whilst there are very few mentions of social sciences terms within the vision there are some clear definitions and interesting framing of asset management. Firstly, it should be noted that this theme was originally the 'engineering' theme and so very much involved with structures, their performance and effectiveness. In moving to

sustainable asset management the frame has been widened. 'Assets' are defined both in the RO statement and the workplan:

'Assets include conventional 'defences' - such as embankments, barriers and pumping stations, natural features – such as river channels, salt marshes and beaches – that contribute to the flooding and erosion process, and temporary flood barriers'

This makes it clear that an asset includes a range of physical structures wider than just the 'conventional defences'. This leads to the other strong message that comes through the RO statement and workplan, and that is the idea that it a systems approach is taken to the management of the assets. This could mean a range of things but does frame the asset management within a wider context of management and processes many of which are social processes e.g. decision making. This suggests a more socio-technical framing of asset management.

Within the vision there are a few mentions of social science words, largely around the perceived outcome and benefit of SAM and a key excerpt is presented below:

'Our vision is therefore that sustainable asset management will:

- *ensure that flood and coastal erosion risk management infrastructure remains appropriate to the changing conditions in which it must contribute to the management of flood or coastal erosion risk*
- *over its service life minimise the **loss of life** due to flooding and provide **best value***
- *enable assets to perform in an optimal manner – both under normal service conditions, and resiliently and predictably under extreme storm or flood events*
- *achieve the **best outcome for people** and both the natural and built environment.*

We aim to reduce the uncertainty surrounding flood and coastal erosion performance, particularly through the introduction of risk based techniques and decision support frameworks to assist in the decision making process and optimise the funding of asset management.

The emphasis of working with natural processes underpins the new Government Strategy through making more space for water through the appropriate use of realignment to widen fluvial and tidal river corridors and to provide wider benefits for recreation and wildlife. We shall develop better understanding of new techniques and build on best practice to increase public confidence in our approach to flood risk management.'

The focus is on the infrastructure but it is clear what the purpose of the asset management is and there are a number of points where social sciences research could be of benefit e.g. decision support frameworks, understanding public confidence and developing wider benefits from flood risk management schemes.

The rationale re-iterates the issues outlined above but also highlights a further aspect: 'greater collaboration with government, local planning authorities, landowners, local communities and other stakeholder groups'.

The issue of collaboration is one which is being considered within another research project (Institutional and Social Responses to flooding) within the IMCE theme and knowledge and thinking on that would be useful to share across themes as it touches on all aspects of the business. Given this, it is also useful to consider the extent to which there is collaboration across different institutions on science projects.

There is one overall objective together with six specific objectives and these are reproduced below:

Overall objective

'To help reduce the risk of flooding and coastal erosion through the application of sound science in developing sustainable asset management systems.'

Specific objectives:

1. Improve understanding of the concepts of sustainability as related to asset management. Investigate and develop approaches that are more adaptable to long term changes in site conditions- climate change (extreme events), morphological change, hydraulic loading etc.
2. Improve our understanding of asset condition (both components and systems) so that our assets in order that they can be appropriately designed, constructed and maintained. Develop knowledge surrounding sustainability issues such as deterioration, resilience and flexibility.
3. Improve our design and management techniques (including risk-based methods) in order to ensure that the condition and performance of assets is in line with their intended standard of service and loading conditions.
4. Identification of means of reducing the whole life costs of assets in order to improve their **value and cost-effectiveness** for given standard of service. Improve the **whole systems** approach to sustainable asset management using **decision support framework tools to help underpin decision making processes**.
5. Improve our **understanding of the construction process** for assets in order to improve the **quality and efficiency** of delivery of the construction product and to minimise adverse environmental impact during construction and maintenance.
6. Contribute to the concepts of **building sustainable communities** and achieving **wider benefits** alongside flood risk management. Improve the **interaction between asset systems and the local environment** (e.g. operational staff / **public H&S, landscape and amenity value**)

The systems perspective is again stressed in the overall objective as is the use of 'sound science'. Alongside the overall objective is a column on 'beneficiary groups' and within that the first group mentioned are 'The people and communities in or adjacent to areas of flood risk' and further down there is a mention of 'particularly vulnerable groups and individual private owners'. It would be interesting to see to what extent these beneficiary groups are included within research processes.

Of the six specific objectives the first three are focussed on the design of assets in terms of their ability to adapt to climate change, their condition and construction. Sustainability is mentioned and it is considered in terms of the robustness and flexibility of structures to be able to adapt to changing conditions over long periods of time.

Objectives 4 – 6 have some mentions of social science related concepts and these are highlighted above. Objective 4 mentions value and costs which would require economics thinking. Further the 'whole systems approach' seems to imply looking at the asset in the context of how it is built through to how it is used and maintained. Within all of that are key questions about what is the asset for, who benefits, who manages the asset, how that management is done and how are decisions made about options for FRM. These are all areas where social sciences research can provide insights to improve those systems. It might be useful, if it has not been done already, to outline what is meant by this and how it is used within the research projects. It could imply a socio-technical perspective and it would be interesting to pursue a project using that as a framework.

Objective 5 considers the construction process which is clearly something which involves how people work and possibly how they change to take on board new ways of working e.g. to ensure an asset minimises environmental impacts. This might be done through regulation but is more likely to be achieved through the development of specific ethos and cultures within companies. Understanding how those human processes influence what is built and how it is built should be able to improve delivery and reduce environmental impact.

Objective 6 has the most potential for innovative social science research and really could be at the heart of moving away from understanding flood management in isolation towards making it a part of the planning of sustainable communities. That is, by linking FCERM with sustainable communities it moves it more into a wider frame, a more holistic view of communities that embraces the physical/social/perceptual interactions. For FCERM to become more normalised, which is probably what is necessary given that flooding is going to increase but is likely to be more unpredictable, then it will be important to have research and thinking that links FRM into spatial planning and general care for local places. This objective also links up with the wider benefits that can be gained from asset management in terms of regeneration. A number of FCERM projects have been embedded within programmes of regeneration (e.g.) and can be the catalyst for partnership working. It would be valuable to understand how effective those schemes are and what needs to be in place for those wider benefits to be realised.

Objective 6 also raised the issue of the relationship between a physical structure and its social and environmental context and this could be about whether people know what the asset is for, how is it cared for or not, how could you get people involved with the design and maintenance of assets and/or their evaluation.

The specific objectives have named beneficiaries within the Environment Agency which is useful as it gives each of the objectives an 'owner'. Beyond those beneficiaries there is a list of 'other stakeholders' but it is not clear how these fit into the research programme, whether they are involved in project boards or are recipients of reports. However, it is a comprehensive list and it includes the Economic and Social Research Council, as well as the National Flood Forum which is a voice for flood communities so in that sense there is a clear acknowledgement of the social aspects of flooding.

As well as the objectives, the programme has four sub-themes which are outlined in the rationale part of the RO statement and these are reproduced below :

The programme will be based on four sub-themes,

1. Risk (SAM)

- Optimisation of operational risk
- **Operational safety**
- Performance and risk based maintenance
- Whole life Concepts

2. Environmental State and Asset Condition

- Improved inspection/assessment tools and techniques
- **Environmental management**
- Practical application of risk and uncertainty
- **Knowledge management**
- Water Framework Directive and Habitats Directive implications
- Impact of extreme floods on environment/ecology

3. Asset Systems (planning intervention)

- **Whole life costs – national dataset**
- Performance based maintenance intervention
- Sustainable design
- Novel forms of coastal protection
- Maximising design life
- **Social behaviour to asset design implications**
- Adaptability in design
- Procurement of design and construction
- Design life – testing and visual assessment
- System analysis for asset management

4. **Delivery Techniques (carrying out the intervention)**

- Site studies of specific structures / materials / environments
 - Flood defence failure/performance ratings and integrity in extreme floods
 - Breach repairs
 - **Temporary flood barriers**
 - **Demonstration and pilot studies**
 - Defence vulnerability assessments and sensitivity to changing conditions
 - **Floodplain restoration and managed realignment**
 - **Abandonment and removal of defences**
 - Sustainable techniques
 - **Good practice in maintenance and repair**

Highlighted are some of the areas of social science interest. For the first three themes there are issues of management across a number of areas: safety, environmental, knowledge together with an issue of costs. The fourth theme emphasises carrying out interventions, and there is clearly a role for evaluation and engagement with stakeholder. It was clear from talking to the Theme Champion and manager that the engagement with stakeholders is an integral part of the process of testing an intervention, but how far the interventions are evaluated in terms of stakeholder perceptions might be something to be considered. In addition, on the list under sub-theme four there are a number of potentially controversial interventions e.g. managed realignment, where understanding stakeholder perspectives would be useful in delivering that intervention.

2.4.2 Findings from interviews with SAM Theme Manager, champion and advisor¹¹

Aims and objectives and key questions for the SAM theme

The aims and objectives for the SAM theme discussed with the Theme Manager and champion reiterated what was in the RO statements and workplan. Specifically, there was an emphasis on moving towards sustainability from both engineering and human perspectives. Given this, it was emphasised that the focus was on the assets and their performance and that perception issues were not for them to investigate, that was for the IMCE theme. The other strong aim emphasised was the practical nature of the projects they work on, the science is closely linked to the business of asset management. Much of the research from the SAM theme ends up as guidance manuals, supporting people directly in asset management. The Theme Manager said she felt part of a wider asset management team that linked the research to the business.

¹¹ The first interview was with Chrissy Mitchell (Theme Manager) and Brian Empson (Theme Champion) and the second interview was with Chrissy Mitchell and Mervyn Bramley (Theme advisor).

The key question that the theme is trying was discussed as how to do sustainable designs where sustainable is defined as a focus on end products and practically in terms of the carbon footprint of the asset.

As well as explaining what the themes key objectives were the interviewees were clear about what was not part of their theme. As noted above IMCE was regarded as '*doing perception stuff*'. Further the Theme Manager talked about the need for SAM to have information on development control and planning but that they would expect this information to come through the SPD theme rather than being something they would need to focus on.

The value of social science research for SAM Theme and FCERM

Social science research for FCERM was considered to be invaluable and this was something that ran through the interviews. However, this was caveated with respect to SAM in that it was explained that the assets have to 'do their job and if they don't then that is a problem'. It was felt that there was an issue with the cost benefit analysis used to appraise flood risk management schemes and that social sciences should be accounted for within that process but also that there should be a recognition of the role of human judgement in the priority scoring rather than a focus on the precise number. So, whilst social sciences research was acknowledged as central to FCERM it was not considered to be central to the SAM theme and through the interview the relevance of social science and of a strategy to SAM was raised a number of times.

When considering what contribution the social sciences would have to SAM R&D over the next 5 – 10 years there was a question as to whether there was a role for social scientists with a query as to how that would work within this theme together with a perception that it was not clear how that would fit in this theme.

Even though there was a question as to the role of social science in the SAM theme there were some issues raised where social sciences research might be of relevance. The issue of providing information about assets was raised, specifically it was suggested that it would be useful to understand what people do with information about flood defences together with a need to get people to understand what the flood defences are for. This issue of the need for social sciences to aid communication and understanding of the value of assets reoccurred through the interviews.

The theme advisor brought out a key issue around how people might understand what an asset can do, what its function is and what happens if it overtops. He was interested in exploring how you improve people's understanding of an asset and what it does? He felt that there was a gap in terms of urban flooding that there should be maps of where the surface water would go so that people could see and plan for an extreme event where standards of defences are necessarily low. He felt there was an interface between asset management, where the water goes and community responses but that perhaps the Environment Agency was too focussed their responsibilities rather than working with others to look at the complete picture of FRM.

In terms of the questions and disciplines raised in the Background paper (see Appendix 4 for details) a number of issues relating to FCERM in general rather than the SAM theme in particular arose. It was felt that not much more could be gained from studying flooded communities and that a lot was already known about understanding the perception of flood risk, so neither of these were felt to be very useful research topics. In terms of disciplines it was felt that economics was key because of the decisions made with respect to scheme selection¹². Human geography was also felt to be important as was political science. However, it was felt that with respect to stakeholder engagement the time and cost outweighs the benefit of carrying out in some cases.

Understanding of the social sciences and social science research

The Theme Manager said that she relies on others to give her information on social sciences and although she has not read any social science she would do work that has an eye on it for example, schemes that have a number of different functions e.g. social and environmental. It was felt that the social aspects were coming through MAR and IMCE to SAM which is connected to them so that would be the way to get social science knowledge into the SAM programme. Further it was expressed that a lot of the social sciences were already taken into account within the SAM theme, *'[I] am struggling with the word social science – it is embedded within a lot of what SAM do – e.g. beach management - have had stakeholder input even though not had a John Colvin equivalent on the board.'* This linking of social sciences with stakeholder involvement and getting a range of perspectives is interesting. It is clear that the SAM theme works in a collaborative way, as the Theme Manager said she *'just does it [collaboration]'*. That is collaboration around the research project rather than researching how collaboration happens as part of the asset management process. The Theme Manager raised an important issue about whether some of the social science issues were research questions or were they just about getting people together and just making decisions. The Theme Champion did ask how would decisions look if *'you put social at the top'*, suggesting an interest and curiosity about how the social sciences might frame some of the FCERM issues.

The issue of information provision, awareness raising and persuasion was discussed as something that SAM theme touched on, that is, what sort of information could help in discussing flood defences and also what do people do with the information currently provided. This aspect was mentioned during discussion of social sciences. It was felt that this theme does take into consideration some social aspects specifically, aesthetics, amenity and recreation and as noted above it was expressed that this was in proportion to the core work of this theme. When asked, the Theme Champion said that they might look at the social benefit of a scheme at a smaller scale e.g. demountable defences, but that this would not be a large part of a project. With respect to design, the theme advisor said, *'that there was a well understood concept of functional design where a structure will have gone through the process of recognising its multiple functions as well as the primary flood defence function but also the amenity function, aesthetic function'*, suggesting that this was an area where social aspects were accounted for.

¹² This uses an economic appraisal process focussed on a benefit cost ratio

When asked if there had been any research looking at the relationship between a community and its assets in terms of what people think about it the theme advisor said that this type of issue might come up in a pre-evaluation of a scheme but the closest research that has been done would be that of in landscape and design guidance which aimed at being specific about certain landscape attributes. As with other themes there was a feeling that the social sciences needed to be communicated in simple ways and that there was a need for dissemination on information about social science and simple concepts. In terms of the background paper it was felt that one page was needed to communicate in engineering terms and that it needed diagrams and pictures, in other words some translation into engineering terms.

In terms of social sciences projects that they felt were useful, two projects within the FRMRC2 which will be looking at urban receptors together with the Risk to Life work were mentioned.

Key criteria by which SAM projects are judged to have been successful

SAM projects have post-project evaluations which are about benefits realisation and cost savings. There is no formal feedback on guidance manuals but the Theme Manager felt the best measure of success was from seeing documents in offices, having people asking about the next step in terms of a project/guidance, and hearing presentations that mention the information in manuals. She felt that if the staff in asset management were happy with an output then that is measure of success. There is no explicit evaluation of the quality of the research.

Constraints and facilitators in trying to achieve aims and objectives

When discussing the constraints faced by the theme in trying to achieve its aims and objectives shortage of staff time, resource and intelligent experience were cited. There are constraints for example on the internet could be used and they feel that they would like to put documents out on systems and develop e-learning packages. A further issue raised was that there are '*snippets of science*' being carried out across the Environment Agency but not all under the science banner. For example reed beds have been trialled on a local basis the benefit is only seen at the local level and because people don't see the benefits so no more money is put into it. The SAM theme is trying to raise the profile of science and its value across the whole business.

In terms of facilitators there are clear links to the business with operational staff on project boards and good relationships generally between research and rest of asset management.

Analysis of the SAM projects

A list of past completed, currently active and possible future (planned) projects was collated and discussed with the Theme Manager and Theme Advisor. The list is included in Appendix 3. The theme advisor provided his analysis of the extent to

which the projects had relevance to social issues and this is also included in the table.

Perhaps not surprisingly the majority of the projects in the SAM are natural science or technical/engineering projects which do not appear to have a role for social science input. Of the projects listed, both ongoing and completed 95% (58) had no social science input, and 5% (3) had a small social science input. All of the projects were undertaken by engineering and technical consultancies or academic departments within universities.

3. Discussion and key issues arising across the four themes

This section aims to draw together the key issues identified across the four research themes according to key areas. It also discusses the general findings and the implications that the findings would have for a Social Science Strategy for FCERM. Table 2 below summarises the key findings across the four Themes.

Table 2: Key findings across the four Themes

Key areas	Strategy and policy development	Modelling and Risk	Incident Management and community engagement	Sustainable asset management
Social sciences 'hooks' in RO statements and work plans	Several mentions of related terms and phrases but no explicit mention of Social Sciences ¹³ or particular research methods or disciplines. No mention of how disciplines may work together, e.g. trans, cross, inter.	Implicit mentions: social and economic processes and impacts; non-structural responses; improving understanding of receptors of risk (including people).	Contribution of social science implicit in work plan and RO statement. Objectives of theme have potential for social science input, particularly in relation to providing flood warnings, vulnerable groups, community resilience, improving inter-agency planning and response.	Few mentions of social science terms, some examples include: loss of life, best outcomes for people, increase in public confidence, etc. However, the framing of asset management is more socio-technical than the former engineering/ defences approach.
Expressed value of social sciences to FCERM and to theme	Social science seen as very valuable; several areas where social sciences could be of use identified by interviewees.	Social science research seen as an essential area to move into in order to achieve some of the theme's objectives, particularly quantifying impacts, risk communication, social modelling.	Interdisciplinary research that includes social science approaches seen as solution to some of the theme's questions. Social sciences needed at all levels of R&D and can provide compelling evidence, e.g. stories to go with the numbers. Focus on results rather than on methods/disciplines.	Social sciences seen as invaluable for FCERM but not central to the SAM theme. For instance, it was felt that social issues such as perceptions were not for them but rather for the IMCE theme to investigate. The relevance of a social science strategy to their theme was questioned.
Knowledge and understanding of social sciences	A number of issues/myths/perceptions raised: it's just common sense; uses a lot of jargon; expensive; how robust are the findings; little understanding of qualitative research; unpredictability of people's behaviour.	Some understanding but generally limited. The issue of language raised, also the need for simple answers to complex questions; quantitative results perceived as robust whilst qualitative evidence seen as 'anecdotal'. Social science methods are seen as taking longer to produce results.	Basic understanding of social science but no in-depth knowledge of any discipline. Hope that social science will become part of all R&D work. Issues of language were highlighted as well as the existence of 'social science sceptics'. Emphasis on simple answers to research questions.	Felt that social sciences knowledge into the SAM programme comes through other themes: IMCE and MAR. Social science aspects are seen to be embedded within the theme's work, e.g. stakeholder engagement. It was also felt that the social sciences should be communicated in a simple way.
Perception of future	Social sciences seen as	Social modelling was identified	Lots of projects with social science	The (future) role of social sciences and

¹³ Except when referring to this project FD2604

role of social sciences in FCERM and theme	valuable and several areas where they could be useful were identified; social sciences considered to be key in future projects in this theme.	as a key area for future input of the social sciences. Another key future contribution could be improving understanding of non-structural measures, vulnerability, etc. Regarding the use for a social science strategy, it was felt that a strategy for all sciences would be more appropriate.	components coming up. Social sciences seen as facilitating asking the right questions.	social scientists within this theme was questioned. However, it was felt that the social sciences could be of relevance for some issues related to people's perception and understanding of the role of flood defences.
% projects with social science elements	Nearly all projects have social science components however, the majority of contractors are engineering consultancies.	71% no social science input, 25% small input, 2% equal input, 2% central role.	Historically, projects have been either technical or social. Theme is trying to avoid that and have more overlap. 66% of projects had no social science input, 8% small input, 4% large input, 21% totally social science.	The majority of projects are natural science or technical/ engineering so only 5% (3 projects) had a small social science input

Social sciences 'hooks' in RO statements and work plans

With the exception of the SAM theme, social sciences related terms and phrases are mentioned in all the themes' work plans and RO statements. However, generally the 'social sciences' are not explicitly mentioned.

Expressed value of social sciences to FCERM and to theme

All themes Managers and Champions see the social sciences as very valuable to FCERM. However, the expressed value to the themes varies:

- i) SPD: social sciences have a central role in the theme,
- ii) MAR: important role but not as the lead discipline but as a necessary complement to other disciplines,
- iii) IMCE: central role particularly in the future and in helping asking the right questions,
- iv) SAM: central role to FCERM but not to their theme in particular.

In the companion document to this report 'R&D Technical Report FD2604/TR The Future of Social Sciences in FCERM R&D' document includes short 'narratives' of what the social sciences could offer to each theme.

Knowledge and understanding of social sciences

The issue of language and jargon was consistently raised. The general view seems to be that social scientists use a very specific language that should be made simpler. This is a difficult issue to address as with any discipline social, natural or other specific terms are used. Having a social science 'champion network' (which is another task of this project) which provides examples of good social science research and resources to learn more about the social sciences, having 'lunchtime seminars' for Defra and EA staff involved in research could help familiarisation with some of the terms.

A social science network and associated resources could also help dispel other usual myths that surround the social sciences, e.g. it is only common sense, it is woolly, qualitative research produces anecdotal evidence, etc.

Lack of resources and skills, e.g. staff with social science knowledge were mentioned raised by the SPD, MAR and IMCE themes. This is one of the key areas proposed to be addressed in the summary document (Twigger-Ross, et al, 2008).

There is an emphasis on finding 'simple, usable answers' to complex questions generally in all themes. This is an interesting perspective and not incompatible with social sciences approaches, it seems useful to start with the questions that need answering and work from them to select the right approach/research method without getting too hung up on the discipline. However, it is arguably at this scoping and planning stage of a research project where the social science input can be more valuable, both to help asking the right questions and to provide the right framing of those questions. If a social science input to a project is deemed valuable at this

stage, then the next stage would look at the most appropriate method. Having a social science input at the planning stage of the research is one of the key suggestions included in the Overview report.

Perception of future role of social sciences in FCERM and theme

All the themes agreed that there is an important role for the social sciences in FCERM and identified several areas where the input could be most valuable (see Table 2). In particular, the social sciences were mentioned in relation to being able to 'ask the right questions'. The SAM theme whilst not questioning the value of the social sciences to the programme as a whole, questioned the role within their theme.

Proportion of projects with social science elements

The social science input to completed, on-going and future projects varied greatly with the different themes. Nearly all projects in the SPD theme have a social science component; conversely the majority of SAM projects are natural science or technical projects. There is also a lack of interdisciplinary working, for instance in the IMCE theme, projects are either technical or social science.

We are not advocating here that all projects need a social science input, however what would be useful is to have social scientist at the table when projects are planned and discussed in order to decide whether the contribution would benefit the project. This recommendation was discussed at the workshop on 5th February and has been included in the summary document (Twigger-Ross et al, 2008).

Contractors in all themes are largely engineering consultancies with few exceptions. We recommend establishing a framework contract for social science contractors so that the themes can have a pool of expertise to draw from (see summary report for details).

4. References

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5. Abbreviations

CFMP	Catchment Flood Management Plans
EA	Environment Agency
EPSRC	Engineering and Physical Sciences Research Council
ESRC	Economic and Social Research Council
FCERM	Flood and Coastal Erosion Risk Management
FRM	Flood Risk Management
FRMRC2	Flood Risk Management Research Consortium - Phase 2
FWD	Floodline Warnings Direct
IMCE	Incident Management and Community Engagement
MAR	Modelling and Risk
NERC	Natural Environment Research Council
PAB	Programme Advisory Board
POL	Proudman Oceanographic Laboratory
R&D	Research & Development
RO	Research Objectives (Statement)
SAM	Sustainable Asset Management
SMP	Shoreline Management Plans
SPD	Strategy and Policy Development
TAG	Theme Advisory Group
TC	Theme Champions
TM	Theme Managers

APPENDIX 1: RO STATEMENTS AND WORKPLANS OF THE FOUR THEMES

Note: In a separate volume

APPENDIX 2: INTERVIEW SCHEDULE

Introductory questions to get the interviewees thinking about the issues and process

Interview starts with interviewer summarising what she considers to be the main themes etc from the RO statements for each theme with the intention of indicating that she does know what the theme is about and in order to start with something familiar to the interviewees.

1. From your point of view, what would you say are the main aims and objectives for R&D projects related to your TAG? What is it that you are trying to achieve through your projects?
2. What are the key questions, or type of questions, to which your TAG is seeking answers?
3. What would you say are the constraints that your TAG currently faces in trying to achieve its aims and objectives? What would you say are the facilitators for your TAG in trying to achieve its aims and objectives? (prompt if necessary: funding, personnel, institutional culture)
4. What are the key criteria by which you judge your TAG projects to have been successful? Are formal project evaluations carried out? IF YES then explore

Questions to try to get a feel for interviewees' knowledge of social science and their possible prejudices or enthusiasms

5. What are your views on the value of social science research for FCERM?
6. Do you feel that you have a good understanding of the social sciences and social science research?
 - a. IF YES – can you say a bit more about what you know and what you would like to know more about?
 - b. IF NO – what do you think you would like to know more about?
7. What do you think that social sciences research can offer the projects in your TAG? How could you use social sciences research e.g. at the strategic (policy) and applied levels?

Views on the background document

8. What are your views on the draft background document?
9. Is there anything that you do not understand in the document that you would like explained further? If YES then explore

10. Is there any way that you feel this document could be improved? If YES then explore
11. How do you see this document and the Social Science Strategy when finalised as being relevant to your TAG?

Questions focussing more specifically on different disciplines and methods

12. Are there any particular social science disciplines from those listed in the Background document (Table 1) that you feel would be most appropriate to contribute to R&D for your TAG, or those which might be inappropriate? Why and how?
13. Are there any particular social science techniques or approaches listed in the Background document that you feel would be particularly useful for contributing to R&D within your TAG or which might help to interpret the research questions the TAG is addressing? Which and how?
14. Can you think of any good examples from past/completed projects where the use of social sciences input may have benefited, or did benefit, the project? Alternatively, can you think of any examples where the use of social sciences input would not have benefited, or did not benefit, the project? Why is this?

Views on longer-term social science input

15. Thinking about future horizon scanning, how do you see the social sciences as contributing to R&D for your TAG over the next 5 to 10 years? (funding, capacity, training etc)

Questions on capacity to manage project with social science input

16. Do you think that Defra and the EA have sufficient staff capacity with experience of social science research to manage any future projects that incorporate a social science element?
17. If not, how do you think that this could be addressed?

APPENDIX 3: PROJECT LISTS

Project Status: Completed = C, Active = A, In procurement = P, Planning = P

Approach used: Quantitative = Qn Qualitative = Ql Both = Both (if the project has no social sciences input then n/a (not applicable) is recorded).

Table 3: Project list SPD Theme

Project code and status	Title	Contractor	Social sciences role in project				Approach used Qn, Ql or Both	Core area(s)	Methods used	Other comments (cost)
			Central role	Equal role in interdisciplinary project	Small role	No role				
FD1702 C	National Appraisal of assets at risk from flooding and coastal erosion	Halcrow, HR Wallingford and John Chatterton		√			Qn	Economics	Risk assessment and economic appraisal	(£115,439 1999-2000)
FD2003 C	Proposed Scheme Prioritisation System Review Project	Risk and Policy Analysts Ltd (RPA)		√			Qn	Economics	Risk assessment and economic appraisal	Background work to the current priority score (£44,992 2000-2001)
FD2004 C	Extension of National Assets at Risk from Flooding and Coastal Erosion			√			Qn	Economics	Risk assessment and economic valuation	follow on work from FD1702 (£106,140 2000-2001)

Project code and status	Title	Contractor	Social sciences role in project				Approach used	Core area(s)	Methods used	Other comments (cost)
			Central role	Equal role in interdisciplinary project	Small role	No role				
FD2005 C	The appraisal of human related intangible impacts of flooding	RPA, Middlesex Flood Hazard Research Centre, economics for the environment consultancy, University College London, University of Newcastle	√				Both	Economics and social research	Focus groups, questionnaires, willingness to pay survey	This project combined solid quantitative social research into the health impacts of flooding with economic valuation work on how much people were prepared to pay to avoid the risk of health impacts. The overall approach would be said to be positivist although there was a lot of qualitative data collected to inform the questionnaire. (£294,493 2001 - 2003)
FD2007 C	Community and Public Participation: risk communication and improving decision making in flood and coastal defence	Scott Wilson Kirkpatrick with RPA	√				Both	Social psychology	focus groups, questionnaires, round tables	This project use qualitative and quantitative method within an essentially positivist framework - a lot of data collected but unclear as to how it was analysed (£115,585 2001 - 2003)
FD2009 C	Consistent Standards of Defence for Flood Cells	David Ramsbottom, HRW, Colin Green, MFHRC		√			Qn	Economics, sociology, hydrology, engineering		(£60,000 2002-2003)
FD2010 C	Flood Plain Management Manual (Phase 1)	David Ramsbottom HRW		√			QI	Planning		This was an applied piece of work aimed at giving guidance to a range of stakeholders about the management of flood plains. It is the synthesis of a range of information into guidance which was to be piloted in a Phase 2 (£25,000 2001 - 2002)

Project code and status	Title	Contractor	Social sciences role in project				Approach used	Core area(s)	Methods used	Other comments (cost)
			Central role	Equal role in interdisciplinary project	Small role	No role				
FD2012 C	Post Event Appraisal Phase 1	Bullen Consultants	√				Qn	Economic appraisal		(£33,000 2002-2002)
FD2013 C	Developing a multi-criteria analysis methodology for application to flood and coastal management appraisals	Risk and Policy Analysts Ltd (RPA) lead	√				Qn	Economics - multi criteria analysis	Workshops, Case studies	(£144,495 2003 - 2004). Looking at an appraisal approach wider than CBA so as to be able to include more social and environmental impacts.
FD2014 C	Development of economic appraisal methods for flood management and coastal erosion protection	MUFHRC	√				Qn	Economic appraisal	Focus groups, questionnaire	(£17,074 2003 - 2005)
FD2016 A	Flood Risk Management Research Consortium	Range of organisations supporting a wide range of projects			√		Both	Stakeholder and Policy theme which use sociology, social psychology	Interviews and surveys	(£900,000 2004 - 2008) This is an interdisciplinary research programme led by the EPSRC but does not include ESRC. This cost is the total across the whole programme - most of which is based in the physical sciences.
FD2018 C	Developing flood and coastal erosion risk management appraisal (Testing the Sugden approach)	M Boath, HL Wilkinson (Risk Solutions)M Spackman (NERA Economic Consulting), M Jones-Lee (Newcastle University Business School)	√				Qn	Economics and social research	Telephone surveys, workshop, expert review, case studies	(£84,673, 2005 - 2006)

Project code and status	Title	Contractor	Social sciences role in project				Approach used	Core area(s)	Methods used	Other comments (cost)
			Central role	Equal role in interdisciplinary project	Small role	No role				
FD2019 C	Developing an evidence base for improving appraisal guidance	Risk and Policy Analysts, Royal Haskoning Ltd	√				Qn	Economics and social research	Questionnaires, and workshops	(£84645, 2006 - 2006)
FD2020 A	Regionalised impacts of climate change on flood flows	Centre for Ecology and Hydrology				√	Qn	Hydrology		(£180,000 2005 - 2008)
FD2021 A	Floodsite support	Support for the EU Floodsite research programme which includes a socio-economic theme	√				Both	Sociology and economics	Interviews, surveys	(£750,000 2005 - 2010) This is the total amount going to the programme - the socio-economic projects are four tasks out of large number of tasks overall.
FD2601 A	Simulation of flood risk and non-structural flood management	University of Newcastle		√			Qn	Economics, land use development, inundation modelling, perception to flood risk and risk analysis	Review of literature and software, data modelling	(£107,200 2006 - 2008) Economics element may be of interest, no further details available currently The aim of the proposed research is to develop and demonstrate an approach to simulating and assessing the long term effect of non-structural measures and their interactions, including land use planning, insurance, damage prevention, preparedness (e.g. early warning systems) and changed building practices (e.g. the use of stilts or bunds), in order to enhance the benefits of such measures.
FD2602 A	Flood-risk management strategies in European	MUFHRC	√				QI		Document analysis, expert interviews	(£42,000 2006 - 2008)

Project code and status	Title	Contractor	Social sciences role in project				Approach used	Core area(s)	Methods used	Other comments (cost)
			Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or Both			
	member states									
FD2603 A	Risk assessment and risk management in small urban catchment areas	Manchester Metropolitan University	✓				Both			
FD2604 A	Supporting the development of a social science strategy for the FCERM R&D programme	CEP	✓				QI	Social research	Interviews, analysis of text	(£63,944 2007 - 2008)
FD2605 A	Social justice in the context of flood and coastal erosion risk management: a review of policy and practice	MUFHRC	✓				QI	Sociology, social research		(£74,295 2007 - 2008)
FD2606 A	Who benefits from flood management policies?	HRW and MHRC with John Chatterton	✓				Qn	Economics and market/social research		(£93,990) 2007 - 2008)

Project code and status	Title	Contractor	Social sciences role in project				Approach used	Core area(s)	Methods used	Other comments (cost)
			Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or Both			
FD2607 A	Improving the evidence base for flood resilience	Entec Ltd, Greenstreet Berman	✓				Qn	Economic and social research	Literature review, market research,	Development and application of appropriate methods to scale up the property level estimates of costs and benefits to a national level. Principally to assemble information on the costs and benefits of measures to produce a series of profiles for each of the individual or packages of resilience/resistance measures covering physical cost of purchase, maintenance cost, level of protection offered, level of benefit, environmental and social issues and technical feasibility. Secondly to identify and research the social and attitudinal barriers to the uptake of these measures.
	Land use planning and flood risk		✓							At specification stage
	Links between WFD and flood management				✓					At specification stage

Table 4: Project list MAR Theme

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
FD2116 C	ERP2 Interpretation and formalisation of geomorphological concepts and approaches	HR Wallingford Ltd				√	n/a			
MP0107 C	Sand transport in oscillatory flow (SANTOSS), costs under MP0107					√	n/a			
MP0107 C	LEACOAST2, costs under MP0107					√	n/a			
FD2318 C	Performance & Reliability of Flood & Coastal Defence Structures - Phase 1	HR Wallingford Ltd				√	n/a			
FD2320 C	Flood Risk Assessment Guidance for new development	HR Wallingford Ltd			√		Both	Planning?	Literature reviews	
FD2323 C	Improving data and knowledge management for effective FCERM	Haskoning UK Ltd			√		Both			Could have had social science input on how people understand questions and seek to answer them?
FD2324 C	Risk Assessment for Coastal RASP	Halcrow Group Ltd			√		Qn	Economics, sociology?		The economics of this could be better (EPR) - focussed on probabilistic methods. Socio-economic aspects will now be incorporated

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
SC020024 C	Geomorphological Component to the River Habitat Survey (RHS) Methodology	GeoData Institute				√	n/a			
SC030008 C	e-learning for fluvial geomorphology - guidebook for Environment Agency	GeoData Institute				√	n/a	Potential for psychology, sociology?		Could have used psychological input relating to behaviour and learning to inform effective e-learning e.g. how people interface with technology
FD2113 C	Spatial Temporal Rainfall Modelling with Climate Change Scenarios	UCL, Imperial College				√	n/a			
FD2117 A	ERP2 Development and demonstration of systems-based estuary simulators	ABP Marine Environmental Research Ltd				√	n/a			Could have looked at management questions but would have been limited input
FD2118 A	Broad Scale Modelling - a Scoping Study on catchment scale modelling for MAR vision	Imperial College Consultants Ltd			√		Both			Will make large reference to socio-economic aspects - future strategy for MAR theme for next 5 years. Stakeholder engagement will come in and other Making Space for Water issues.
FD2120 A	Analysis of historical datasets to look for impacts of land use and management change on flood generation	Lancaster University				√	n/a			This is a technical project but MSfW is doing a parallel study interviewing farmers for policy

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
FD2319 A	Measuring changes in ground levels and tide gauges, using GPS and absolute gravity	Proudman Oceanographic Laboratory, Nottingham University, NERC				√	n/a			
FD2121 A	Software protocols and architecture specification for RASP work	Halcrow Group Ltd				√	n/a			
FD2119 A	ERP2 - Estuary management system - scoping and dissemination	HR Wallingford			√		Qn		Stakeholder engagement and Gap analysis	Socio-economic aspects not there yet but will be in future work
AE1039 A	National Coastal Data Co-ordinator (IACMST)					√	n/a			This is a post funded by the project
SC050051 A	MDSF2 Main Project – principal MAR project. [Technique will now also be applied at local levels rather than for catchments etc.]	HR Wallingford			√		Both	Potential for economics, political science, sociology, human geography	Economic appraisal methods, governance and stakeholder engagement, social impact assessment	Modular system that builds in different modules. Will be large opportunity for social science as long-term project.
SC050050 A	Improving the FEH Statistical Index Flood Method and Software					√	n/a			
SC040029 A	Dissemination of the Revitalised FEH rainfall-runoff method	CEH Wallingford				√	n/a			
SC050028 C	Risk assessment for flood event management	HR Wallingford			√		Both	Some expert judgment used by social scientists	1 day workshop for stakeholder consultation	Could have used psychology for behavioural research on responding to warnings and risk communications but limited time available

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
SC050065 A	Scoping the development and implementation of Flood and Coastal RASP Models	HR Wallingford				√	P			Fits into MDSF2
SC050064 A	RASP HLM+ Sensitivity Analysis for Improving NaFRA 2006	HR Wallingford				√	P			
FDI(06)01 A	SANTOSS - User-representation for improved coastal sand transport predictors, European research					√	P			
FDI(06)02 A	Design guidance for shore-detached break waters in macro-tidal environment - LEACOAST2					√	P			
FDI(06)07 P	Desk top knowledge management tool for effective use of data and models in non-structural FRM				√		I/P			Now re-written and postponed Some of the original project is now to go into another proposal.
FDI(06)05 P	Development and Dissemination of Information on Coastal and Estuary Extremes					√	P			
MAR/D1.3 P	Development of tools (Damage/Impact Curves) for assessing direct intangible impacts of flooding on people				√		I/P			Project shelved
FDI(06)03 P	Risk-based methods to assess, model and map the environmental consequences of flooding					√	P			

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
FDI(06)08 P	Multiscale Experimentation, Monitoring and Analysis of long-term land use changes and flood risk					√	P			
MAR/D2.2 P	Developing methods for representing the impact of urban areas on flood risk at catchment scale				√		P			Project shelved ; Needs good economics input and social impacts
FDI(06)06 P	Characterisation and predict large scale long-term change of coastal geomorphological behaviours					√	P			
FDI(06)09 P	Next generation of flood risk modelling – risk from all sources of flooding					√	P			Project changed and shelved
FDI(06)04 P	Improved approaches to reliability analysis in flood event incident management planning				√		I/P			Phase 2 of SC050028. Scope for social science e.g. RASP, MDSF
SC060032 PI	Tools for effective use of non-structural flood risk management measures				√		I/P		Scope for social science input in RASP and stakeholder consultation etc.	Now two merged projects.
FDI(07)04 PI	Climate change impacts: detecting change, new climate scenarios and possible implications and responses to rapid climate change					√	P			

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
FDI(07)05 PI	Spatial coherence of flood risk: joint probability of flooding from multiple sources and potential impact of climate change					√	P			
FDI(07)10 PI	Assessment of impacts of Non-structural measures (land-use planning, development control) and public resilience			√			I/P			At specification stage
FDI(07)06 PI	Methodology to understand and assess customers preferences and the nature of social choices, in FRM for CFMPs and SMPs		√				I/P	Economics	Surveys, CVM, MCA	Project shelved Still has potential to be completed in future as project was found to be scientifically valid and to have a business need
FDI(07)02 PI	Towards detecting trends in extreme upland fluvial / flash flood - database and planning tool for catastrophic flooding					√	P			
FDI(07)03 PI	Best practice guidance for risk modelling and visualisation of modelling outputs					√	P			
FDI(07)08 PI	Modelling urban flood response using the revitalised FSR/FEH rainfall-runoff method					√	P			
FDI(07)09 PI	Interactions of estuary - coastal - fluvial floods and sensitivity of estuaries to variations in fresh and salty water flow					√	P			

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
FDI(07)11 PI	Standardising, Integrating and improving risk mapping in coastal areas (support to MSfW-Coastal RASP and NaFRA-RASP HL+)					√	P			
FDI(07)07 PI	Flood Frequency Estimation - bringing together FEH and continuous simulation methods					√	P			
FDI(07)01 PI	New technologies for topographic survey and asset inspections data					√	P			
SC060063 (PI)	Improved approach to reliability/uncertainty analysis of components and systems in flood incident management planning				√		I/P	Economics, sociology?	workshops, stakeholder consultation, interviews	At specification stage
SC060062 (PI)	Methods to assess, model and map the environmental consequences of flooding					√	P			At specification stage

Table 5: Project list IMCE Theme

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
W5C(99)01/2 (C)	Flood forecasting and warning - Good practice baseline review	Mott MacDonald			√		Both			Completed April 02. Internal review of EA systems and how differ in Regions. Useful project but conclusions not acted on as NFFWC folded soon after
W5C(99)01/3 (C)	Reducing the Impact of flooding - Stage 1	CIRIA (Roy Stokes EA Project Manager)				√	n/a			Completed April 01. About choices/options for protection
W5C(99)01/4 (C)	Rainfall Forecasting	WS Atkins				√	n/a			Completed May 03
W5C(99)01/5 (C)	Real Time Modelling	WS Atkins				√	n/a			Completed May 03
W5C(00)01 (C)	Flood Warning for Vulnerable Groups	Univ of Surrey	√				Both	Sociology	Literature reviews, focus groups, survey, mapping	Completed Feb 05
W5C(00)19 (C)	Mitigation of Climate Induced Natural Hazards (MITCH)	HR Wallingford				√	n/a			Completed Mar 03. Useful website
W5B(95)01 (C)	Predicting extreme water levels in estuaries for flood warning	Halcrow				√	n/a			Completed Jan 02
FD2201 (C)	Extreme Event Recognition Phase 1	Univ of Salford				√	n/a			Completed April 02. Catchment rapid response framework in Phase 2
FD2202 (C)	Improving dissemination of flood warnings Phase 1	Qinetic				√	n/a			Completed Sept 04
W5C(00)02 (C)	The Social Performance of Flood Warning	FHRC	√				QI	Geography, sociology	Literature reviews, telephone	Completed Aug 05

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
	Communications								interviews	
W5C(01)01 (C)	Development of Flood Warning Management System Phase 1	CIS				√	n/a			Completed Dec 03
W5C(01)02 (C)	Estimating antecedent conditions of catchment wetness	Met Office				√	n/a			Completed Aug 03
W5C(01)03 (C)	Inclusion of organisations in flood planning and warning - Supporting activities	NFF	√							Completed Mar 05 No outputs on Defra web. Funding for setting up of NFF
FD2206 (C)	Best Practice in Coastal Flood Forecasting	HR Wallingford				√	n/a			Completed June 03
FD2207 (C)	Storm Scale Numerical Modelling	Met Office				√	n/a			Completed Dec 04
W5C(02)01 (C)	Improved Flood Warning Awareness and Response in Low Probability/High Risk Flood Zones	Greenstreet Berman	√				QI			Completed June 03 No outputs on Defra web
W5C-13/6 (?)	Best Practice in Transfer Function Modelling	WS Atkins				√	n/a			Completed ??
FD2209 (?)	Dissemination Methods Phase 2	Qinetiq				√	n/a			Completed ??
W5-112 (C)	Public Response to Flood Warnings	Univ of Surrey	√				QI	Sociology, psychology	Literature review, focus groups, one to one interviews, survey	Completed Mar 04

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
W5E(0304 (A)	Community Engagement in its flood history	Gloucester Univ		√			QI	History, anthropology, geography	Oral history, diaries	Still in progress. Due to produce a guidance manual
W5C-021/2a (C)	Development of Protocols for Creating Minimum Standards in Modelling	JBA				√	n/a			Completed Sept 03
W5C--21/2b (C)	Performance Measures in the Delivery of Flood Forecasting & Warning	HR Wallingford				√	n/a			Completed Sept 03
FDK(05)02 (A)	Coastal Flood Forecasting	HR Wallingford, POL, Met Office				√	n/a			In progress till Mar 08
W5C(04)03 (A)	Radar in Steep Upland Catchments	Met Office				√	n/a			In progress till Mar 07
W5E(03)02 (C)	Forecasting for Ungauged Catchments	CEH Wallingford				√	n/a			Completed Mar 06
W5C(04)02 (C)	Managing the social consequences of floods (Phase 1)	CEP	√				QI	Sociology	Literature review, interviews	Completed May 05
FDK(05)01 (A)	Technology Tracking (follow up)	Qinetiq				√	n/a		Horizon scanning report each year.	Completed. Tracking to be done in-house in future
W5C(04)04 (C)	Local FW Dissemination Trial	Qinetiq			√		Qn			In progress till June 08. Social science input to be worked up
FD2210 (A)	Modelling Extreme Rainfall Events	Met Office				√	n/a			In progress till Aug 07
W5E(03)13 (C)	Achieving Technological Innovation in Flood Forecasting (ACTIF)	HR Wallingford				√	n/a			Completed Mar 06

Project code and status	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Other comments
			Central role	Equal role in interdisciplinary project	Small role	No role				
FD2208 (C)	Extreme Event Recognition Phase 2	Met Office				√	n/a			Completed Dec 05
FDK(04)06 (C)	Flood Resilient & Resistant Construction	CIRIA				√	n/a			Completed Mar 07. Report available
FDK(06)01 (P)	Duty Officer Support & Training Needs	?	√				NA			Not yet started. Mainly to focus on support.
FDK(06)02 (A)	Radarnet IV Algorithm	Met Office				√	n/a			In progress till Dec 08
FDK(06)03 (A)	Hydrological Modelling using Convective Scale Rainfall Forecasts	Delft				√	n/a			In progress till Sept 09
FDK(06)04 (A)	Improving institutional and social responses to floods	CEP, Lindsey Colbourne Assocs	√				QI	Sociology, geography, psychology	Literature reviews, workshops, focus groups, interviews	In progress till July 08
FD2910 (A)	Probabilistic Forecasting (or FIM) Scoping Study	WS Atkins			√		Qn			Completed. But follow-on project needs to look at risk perception
W5G(04)03 (A)	Floodsite Liaison	CEP, HR Wallingford		√			NA			In progress till Mar 10. Not really R&D but allied to R&D
			21%	5%	8%	66%				

Table 6: Project list SAM Theme

Project code	Old code	Title	Contractor	Social science role in project	Approach used	Core area(s)	Methods used	Assessment of 'Application to social
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and status				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, Ql or both			science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
PROCESSES											
	W5B-013 (0592)	Pollution of Managed Realignment at Orplands and Tollesbury	Imperial College, London				√	n/a			None To undertake annual sediment surveys at two managed realignment sites in order to assess the effects of saline inundation on sediment quality, and to determine how inundation affects the partitioning and bioavailability of metals in the sediments.(1995-2002)
FD1004		Estuary morphology - survey and modelling for managed set-back site	HR Wallingford Ltd				√	n/a			None To determine the impact of a managed set-back scheme on estuary morphology through monitoring changes in bathymetry within Tollesbury Fleet and around the breach. To improve understanding of sediment movement in the estuary and within the site by numerical modelling. (£196,000; 1994-2002)
FD1101		Additional monitoring at the Tollesbury site	Natural Environment Research Council				√	n/a			None To monitor changes in estuary bathymetry, sediment dynamics, soil character, and colonisation by invertebrate infauna and halophytes during the early development of a managed set-back site in Tollesbury, Essex. To investigate the impact of invertebrates on saltmarsh development.(1996-2002; £33,000)

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, Ql or both			
FD1914		Guidebook of Applied Fluvial Geomorphology	Notice Ltd				√	n/a			None To produce a guidebook on the current state of applied fluvial geomorphology suited to the needs of end users wishing to adopt geomorphic principles, analyses and design approaches in river management and engineering. It is to be based on R&D undertaken (2001-2003; £24,000)
FD1901		Development of predictive tools and design guidance for mixed beaches - stage 2	HR Wallingford Ltd				√	n/a			A little To facilitate the development of Coastal Strategy Plans and Beach Management Plans by consolidating recent DEFRA funded work on surf zone hydrodynamics over porous beaches and continuing to monitor and review existing data, published research, laboratory (2000-2003; £190,000)
FD1916		Understanding the lowering of beaches in front of coastal defence structures	HR Wallingford Ltd				√	n/a			None To identify generic elements and processes involved in the scour of beaches in front of coastal defence structures and to define research needed to improve understanding of beach lowering by toe scour so as to provide design guidance for its

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or both			
											mitigation.(2003; £30,000)
FD1915		Understanding & Predicting Beach Morphological Change Processes Associated with the Erosion of Cohesive Foreshores	Posford Haskoning				√	n/a			None To provide a comprehensive review of the processes of erosion of cohesive clay foreshores and their relationship to change in beach form., and to define an innovative R&D project to improve the knowledge base for the management of these coastlines. (2003-2004; £30,000)
SC020035	W5A(02)01[1]	Habitat Quality Measures and Monitoring Protocols	CEFAS				√	n/a			A little To develop practical measures of habitat quality and monitoring protocols in relation to managed realignment and habitat migration sites, to facilitate the management and development of such sites and enable corrective action to be taken where necessary.(2003-2004; £44,000)

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, Ql or both			
FD1920		River Sediments & Habitats & the impact of Maintenance Operations & Capital Works	HR Wallingford Ltd				√	n/a			A little To improve the understanding of the interactions of sediments, habitats and conveyance as affected by maintenance operations and capital works, and to identify requirements for field trials, suitable locations, data collection and storage requirements (2003-2004; £30,000)
FD1917		Suitability criteria for habitat creation	CEFAS				√	n/a			A little To produce an electronic decision tree for users to assess the potential of specific sites for habitat restoration schemes. This will be achieved by reviewing a) the existing knowledge on the criteria for growth of natural saltmarsh habitats and b) the guidelines for selection of sites for habitat restoration. (2003-2004; £66,000)
	W5B-013	Shingle Beach Transport Models	HR Wallingford, Brighton University Trading Comp, Plymouth University, Portsmouth University, Southampton				√	n/a			None To develop improved techniques for the prediction of beach transport and development where coarse sediments (shingle) form a significant portion of the beach material. (1996-2002; £84,000)

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or both			
			University								
ENGINEERING											
	W5-A02	Expert support for national R&D flood defence: coastal	Michael W Owen				√	n/a		To provide independent expert advice needed for the effective development and management of R&D projects in the Coastal Topic Area.(1997-2000; £90,100)	
	W5-A01	Expert support for national R&D flood defence: fluvial	ATP Engineering Consultancy, David Noble Associates				√	n/a		To provide independent expert advice needed for the effective development and management of R&D projects in the Fluvial Topic Area. (1997-2000; £123,000)	
	W5A-032	Civil Engineering Applications of Geophysical Investigations	CIRIA				√	n/a		None To investigate the use of geophysical techniques in order to provide guidance on their use in determining engineering parameters of ground materials and their potential for investigating ground and groundwater contamination. (1996-2000; £13,000)	

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or both			
	W5A-049	Guidance for Use of New and Recycled Materials in Fluvial and Coastal Flood Defence					√	n/a			A little To identify the potential uses of recycled materials in flood defence works, and to produce a guidance manual for use by all parties involved in flood defence works. (1998-2000; £50,000)
	W5A-03	Sustainable urban runoff - Phase 2	CIRIA				√	n/a			Significant To promote sustainable solutions to the control of runoff from new developments in order to develop best practice guidance and to solve problems of responsibility. (1997-2001; £153,000)
SC960002	W5B-004	Coastal Defence Design and Practice Guide	Institution of Civil Engineers				√	n/a			Some To produce a guidance document to advise coastal engineers on the selection, design and construction of a coastal defence systems and where to obtain further information which is required.(1996-2001)
	W5B-025	Anti Vibration Glove Assessment in Relation to Work with Strimmers	Health & Safety Executive			√		?			Significant To test the effectiveness of anti vibration gloves when used with strimmers to investigate whether the high cost of supplying them is justified (2000-2001; £30,000)

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or both			
	W5A-063	Flood Resistance of Domestic Buildings and Small Business Premises	WS Atkins				√	n/a			Significant To investigate approaches and supporting codes and standards to provide for security of a) new and b) existing buildings in approved locations against extreme flood events, and to produce nationally applicable guidance. (2001, £33,000)
FD1302		Sand dune processes and management for flood and coastal defence.	Royal Holloway College, UL				√	n/a			A little To review the current methodologies and techniques available for the management of coastal dune systems. To evaluate the effects of climate change on dunes and associated beach systems and assess the likely effects of removing hard defences (1999-2001; £26,000)
	W5A-075	Scour at bridges and other hydraulic structures	CIRIA				√	n/a			None 2002
	W5A-01	Design and Operation of Trash Screens Phase 3	Posford Haskoning, ATP Engineering Consultancy, David Noble Associates				√	n/a			Some To provide a best practice guide on the design and operation of trash screens based on feedback from use of the Interim Guidelines. (1997-2002; £90,000)

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, Ql or both			
	W5-T02	Centre for Aquatic Plant Management - Initial Phase	Centre for Aquatic Plant Management, Non Purchase Order				√	n/a			None To support a programme of work identified by the British Waterways Board, Internal Drainage Boards and the Environment Agency related to management and control of aquatic plants (1997-2002; £294,000)
FD2410		Coastal Flooding Hazard by Wave Overtopping	HR Wallingford Ltd				√	n/a			Some In collaboration with a number of other European projects, to improve numerical models of wave overtopping of coastal defence structures and to develop design guidance as to which models are suitable for which circumstances. (2001-2002; £140,000)
FD2403		Soft Cliffs: Prediction of Recession Rates and Erosion Control Techniques: Examples and Publication	Rendel Geotechnics Consultants				√	n/a			A little To update, expand and publish the results of an earlier DEFRA project on soft cliffs that predicted recession rates and developed erosion control techniques. (2001-2002; £30,000)
	W5A-062	Temporary and Demountable Flood Defences - Phase 1	Posford Haskoning				√	n/a			Significant To provide guidance on the use of temporary and demountable flood defence systems by the EA and other players involved in defence of groups of properties from flooding,

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, Ql or both			
											including support for demonstration and testing of specific systems. (2001-2002; £110,000)
FD2409		Low Cost Rock Structures for Beach Control and Coast Protection	HR Wallingford Ltd				√	n/a			Some To produce practical guidelines for the design and assessment of low cost rock structures for beach and coast protection. (2002, £70,000)
	W5A-057	Reducing uncertainty in river flood conveyance, Phase 1	HR Wallingford				√	n/a			None 2003
	W5A042	Condition Monitoring and Asset Management of Complex Infrastructure Systems	Bristol University				√	n/a			None To explore the use of decision support techniques applied to CMAM to improve the safety and economic performance of complex infrastructure systems. (1999-2003; £16,200)
	W5A-056	Capture and Novel Use of Aerial Survey and Remote Sensing Information on Floods 2000	Environment Agency - National Centre Environmental Data & Surveillance				√	n/a			None To assess what information on the coverage of the floods can be obtained from satellite imagery over the period October / November 2000 (2000-2003; £25,000)

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or both			
SC000039	W5A-059	Concerted Action on Operation and Maintenance of Flood and Coastal Defences	Posford Haskoning, HR Wallingford				√	n/a			Some To review the overall area of Operation and Maintenance (O&M) activities carried out by the Agency and Local Authorities on Flood and Coastal Defences to identify issues that will benefit from R&D and to define a related programme of practical R&D. (2000-2003; £67,000)
SC010054	W5A-068	Coastal and Marine Environmental Site Guide	CIRIA				√	n/a			A little To inform front-line construction staff working on coastal and marine construction projects about the environmental impacts associated with a range of common construction operations and to provide guidance on avoiding or mitigating those impacts. (2001-2003; £10,000)
SC010032	W5B-023	Weirs Best Practice Guidance	Mott MacDonald				√	n/a			Some To prepare a guidance note for Managers and riparian owners identifying considerations when decommissioning, refurbishing or constructing weirs, including benefits associated with the Agency's wider responsibilities, to assist in the decision making process. (2001-2003;

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or both			
										£28,000)	
SC000047	W5A-060	Application of River and Coastal Restoration and Habitat Guides Improvement Techniques	River Restoration Project Ltd., Edenvale Modelling Services				√	n/a		A little To undertake preparatory site data collection and web-site development to facilitate production of a tool kit for river restoration and habitat improvement and to update the existing River Restoration Manual (2000-2004; £45,000)	
SC010009	W5G-010	IACR Centre for Aquatic Plant Management Programme	IACR Rothamsted Experimental Station, Non Purchase Order				√	n/a		None To support the Flood Defence Operating Authorities with research based advice on best management practices to enable the Agency to manage aquatic and riparian vegetation in the most cost-effective and environmentally sustainable way now and in the future. (2001-2004; £270,000)	
FD2413		Guidance on design and implementation of managed realignment	Construction Industry Research Assoc				√	n/a		Some To improve the design and implementation of managed realignment projects and encourage wider use as a tool for achieving sustainable coastal management and	

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used Qn, QI or both	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role				
										flood defence (2003-2004; £50,000)	
	W5-027	Fluvial Design Manual Phases 1 and 2	Binnie Black & Veatch				√	n/a		Some To produce and maintain a fluvial design manual on basic flood defence design procedures. (1997-2004; £56,000)	
SC 010058	W5-105	Benchmarking and scoping of hydraulic models	Bullen Consultants				√	n/a		None 2005	
	W5A-061	Hydraulic performance of bridges and other structures at high flows - Phase 1	JBA Consulting				√	n/a		None To review the existing information on the hydraulic characteristics of river bridges and other structures at high flow conditions, including the impact of blockages, in order to identify future research needs, management practices and modelling requirement (2005)	
SC 010046	W5A-078	CA on Delivering the Construction Product - Safety in marine construction	HR Wallingford				√	n/a		Some 2005	
	W5A-034	Design guide on site drainage	HR Wallingford				√	n/a		Some To provide a guidance document for use by those involved with site drainage in order to assist Agency officers and other parties in specifying and complying	

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used Qn, QI or both	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role				
										with requirements for developments. (2005; £12,000)	
	W5i 609	Manual on sediment transport and alluvial resistance in rivers	HR Wallingford				√	n/a		None 2005	
FD2411		Reducing the risks of embankment failure under extreme conditions	HR Wallingford Ltd				√	n/a		Some To enable Operating Authorities to understand and address critical issues related to the effective performance of flood and coastal defence embankments – particularly to develop a risk-based framework for their design, inspection and maintenance. (2001-2005; £208,000)	
SC 000042	W5A-057	Reducing uncertainty in river flood conveyance, Phase 2 (CES)	HR Wallingford				√	n/a		None 2005	
	Contribution to WQ project	SUDS techniques - hydraulic, structural and water quality advice	CIRIA				√	n/a		Some 2005	
	W5D-002	SUDS techniques - source control using constructed pervious surfaces	CIRIA				√	n/a		Some 2005	

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or both			
SC020119	W5-071	Standards for the Repair of Flooded Properties	CIRIA				√	n/a			Significant To develop standards for adapting and repairing buildings that have been or may be affected by flooding to improve their flood resistance - Includes guidance on Flood Products related Kitemark scheme (2003-2005; £35,000)
SC 010053	W5A-069	Engineering materials in Flood and Coastal Defence - Manual on use of timber in river and coastal engineering	HR Wallingford				√	n/a			Some
SC 010053	W5A-069	Engineering materials in Flood and Coastal Defence – Review of current knowledge	HR Wallingford				√	n/a			A little
SC 030219	W5-074A	Urban drainage interface with Operating Authorities – New rainfall / runoff guidance for developers	HR-W, CEH				√	n/a			None
	W5-027 W5-077/A	Fluvial design guide / Standard design – Scoping (Phase 3)	C Rickard, Independent Consultant				√	n/a			A little
ENGINEERING (projects completed or in transition from SAM theme progress report)											
FD1924		Understanding barrier beaches					√	n/a			A little 2005-2006
FD1926		Understanding and Predicting Beach Morphological Change, Erosion of					√	n/a			None 2005-2007

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used Qn, QI or both	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role				
		Cohesive Shore Platforms									
FD1927		Lowering of beaches FD1916 Part 2					√	n/a		None 2005-2006	
FD1923		Impacts of permeability on beach performance					√	n/a		None 2005-2006	
SC060005		Beach Management Manual (BMM) - Scoping					√	n/a		Some	
FD2411		Reducing the risks of embankment failure under extreme conditions					√	n/a		Some 2001- 2004	
SC000021		Demo project on Integrating buildability & improved efficiency into coastal structure & harbour schemes				√		n/a		Significant	
SC030218		Hydraulic performance of river bridges and other structures at high flows - Phase 2					√	n/a		None	
SC030221		Rock in river and coastal engineering					√	n/a		A little	
tbc		Sand Dunes best practice					√	n/a		Some	
SC020101		Landscape and Environmental Design Guidance				√		Qn?		Significant	
SC010100		Disease in Alders and Biological Control of Japanese Knotweed					√	n/a		A little	

Project code and status	Old code	Title	Contractor	Social science role in project				Approach used	Core area(s)	Methods used	Assessment of 'Application to social science issues' (None, A little, Some, Significant) by Theme Champion; project objectives; date and budget
				Central role	Equal role in interdisciplinary project	Small role	No role	Qn, QI or both			
SC030220		Update of Saltmarsh Management Manual					√	n/a			A little

APPENDIX 4: BACKGROUND PAPER FOR SUPPORTING THE DEVELOPMENT OF A STRATEGY FOR SOCIAL SCIENCE FOR FCERM R&D

1. Introduction

There is now increasing use of social science within the Joint Defra/Environment Agency Flood and Coastal Erosion (FCERM) Research and Development (R&D) programme. However, FCERM R&D project Managers and Defra/Environment Agency policy and operational staff making use of these projects, are relatively inexperienced in developing, delivering and interpreting FCERM social science, although this is now changing.

It was therefore agreed in 2006 to develop a social science 'strategy' for the FCERM R&D programme, as a means of supporting staff in this new area of practice. It was agreed that the purpose of this strategy should be to build staff understanding, skills and confidence to recognise where social science can add value to traditional approaches, to try out new approaches, and to evaluate these.

The purpose of this background paper is to support the development of such a strategy by:

- outlining why a social science strategy can add value;
- suggesting some examples of the types of research questions that social science input
- could help to address within the remit of the four R&D programme Themes;
- providing an outline of the social sciences, which the future strategy and research could draw upon;
- introducing some of the key techniques and approaches which can be employed.

2. The need for an interdisciplinary approach to R&D

The historical legacy of the past emphasis on flood defence resulted in R&D that encouraged an engineering and natural/physical science focus. Where it was included, social science research was often seen as a 'bolt on' and not embedded as part of a multi-disciplinary process. For example, the potential for social science to help answer policy questions was not given the same status as natural and physical science within Defra (SAC, 2006). There was even a perception that social science research is about market research and successful dissemination of communication of policy, rather than being able to contribute to informing policy development (SAC, 2006).

R&D needs to provide a sound evidence base for the policies and operational work of Defra and the Environment Agency and to help inform management of the environment as efficiently and effectively as possible. The Science Advisory Council

(2006 p.5) suggests that of Defra and its agencies' total expenditure on science, engineering and technology for 2004-2005, a figure of only 3% was classified as social science. The low level of spending of social science research is paralleled by the low numbers of social researchers employed within Defra and the Environment Agency in comparison with natural and physical scientists. This lack of social science expertise also raises concerns over whether current research which does include social science components is being well-specified, is using the best experts and whether staff are qualified to evaluate the work and interpret the results. This current lack of balance in science research (also pointed out by the Government Chief Social Researcher in 2006 (SAC, 2006 p. 8) needs to be addressed. The capacity of Defra and Environment Agency staff to act as intelligent customers who appreciate the potential and the limits of social science research thus needs to be increased.

The above arguments are increasingly relevant in light of the new strategic direction for flood and coastal risk management in England which was set out in March 2005 in response to the proposed direction in the Government's *Making Space for Water* report (Defra, 2005). This new strategy aims at putting **people** and the environment at the centre of policy making and to deliver the greatest economic and social benefits consistent with the Government's sustainable development principles. In parallel with this, the current Corporate Strategy of the Environment Agency - '*Creating a Better Place*' - has the objective of allowing people to achieve a 'Better quality of life'. In order to achieve these goals of putting people first a better understanding of people, society and social issues is crucial.

3. How the social sciences might be used in FCERM research

The use of social science approaches, methods and tools within the FCERM R&D Programme could provide benefits in a number of ways, for example:

- by highlighting business efficiency and effectiveness measures (those which drive the R&D programme);
- by contributing to knowledge on helping to balance the costs and benefits of policies and practices and justify spending;
- by complementing research from the natural, engineering and physical sciences in order to give a wider multi and inter-disciplinary perspective on problems to be addressed and their possible solutions;
- by addressing real world issues, such as those on the sustainable development agenda, and some of the interesting and complex questions at the interfaces between disciplines, which cannot be addressed satisfactorily by a single discipline;
- by building new knowledge and ways of thinking e.g. by involving other stakeholders along with their knowledge;
- by presenting R&D results in an open and accessible manner, using simple and appropriate language;
- by increasing the capacity of the Agency to achieve the objectives of its Corporate strategy;

Moreover, the 1999 Cabinet Office *Modernising Government White Paper* and the 2001 *Better Policy Making* reports both emphasise the need to improve the quality of policy and decision making, which cannot be achieved without the input of the social sciences. Social science research can thus be used to help inform:

- Long-term strategic needs
- Medium-term policy priorities
- Shorter-term operational requirements

Like the other sciences, the social sciences evolve through the interplay of the ideas, theories and practices of academics, and the evidence that supports or refutes them. Social scientists have made a significant contribution to *understanding* our lives, both objectively and (importantly) subjectively, as well as providing evidence of the need for change and analysing change that has happened. Often social scientists have shaped our lives without us even being aware of it. For example, the role of governments in an increasingly market based society has, during the last century, been determined by famous thinkers such as John Maynard Keynes and Karl Popper. It was an economist who first developed the idea of a National Health Service. The payment of billions of pounds of state benefits for the needy has also been influenced by the work of social scientists (ESRC website, 2007).

Social science research can help to answer some of the questions current to FCERM research and even to identify future questions to which we will need an answer. Social science can be relevant in clarifying and refining the processes through which natural scientific evidence is itself generated and interpreted. Table 1 sets out some examples of FCERM questions that the different social science disciplines may help to address.

Within the Joint Programme the four R&D Themes will have different links and routes to embedding social science into practice. These are outlined further in the separate Vision document for social science research which also summarises where social sciences and interdisciplinary research is going within the four themes and FCERM R&D over the next 5-10 years. Overarching all the Themes is the need for a single model for what is good science.

Table 1 Examples of questions that FCERM professionals find difficult to answer

Discipline	Psychology	Economics	Sociology	Social policy	Political science	Human geography	Social anthropology	Spatial planning
Policy domain								
Risk assessment research	How does the public understand risk, and why do they not understand it better?	What are the real (full) economic consequences of a flood, or an erosion event? What are the drivers of risk in the future?	How and why is vulnerability different for different groups, and how does this relate to social context?	How do policies about risk impact on different groups?		How is risk related to 'place', and what does this mean?	Why do different communities understand flood risk in different ways?	How is risk related to specific use of land?
Policy/portfolio choices research		How do we assess the efficiency of different <u>collections</u> of policies?	What is equitable FCERM? What is socially just?		Why do certain policies get accepted?	How do structural and non-structural policies relate at particular sites?	What is the influence of organisational culture on policy development?	How the ensemble of different sector policy choices affect quality of places and quality of life for people who live and work in those places. How can local interest be reconciled with wider (often global) interests?
Public engagement research	Why is the public often so difficult to engage? How can we change people's attitudes and behaviour?		How do we facilitate effective stakeholder engagement?	How do people engage with FRM policy?	How does collective action differ from individual action?			
Implementation research	Why is public opinion so fickle?				How can we develop good governance in FCERM?	How does the public trade off different options in different locations?		How is the politics of place played out in the spatial planning processes? How do we define and
Effectiveness and efficiency research		Why are some policies and						

(post-project appraisal)

plans so inefficient (e.g. land use planning)?

measure effectiveness and efficiency?

4. What are the social sciences?

In order to develop a strategy for the contribution of social science research to FCERM we need to understand what we mean by the term 'social sciences'. Definitions are important in order to establish a common language and to enable communication around the opportunities and boundaries of a given topic. A broad definition from a recognised source of expertise (the Economic and Social Research Council, 2007) is that:

'Social science is, in its broadest sense, the study of society and the manner in which people behave and impact on the world around us'.

However, as the Commission on Social Sciences (2003) argue, it is not meaningful to talk about 'social science' because there are a range of approaches and value systems that are held by active social scientists. To reflect this diversity, we suggest using the term 'social sciences' in the plural.

4.1 The Social Science Disciplines

Disciplines have developed through historical processes with social and functional dimensions. Socially, they provide identities which include a shared language and a set of tools; functionally, they provide a set of rules for:

- what constitutes a 'problem',
- what counts as evidence, or
- what are considered as acceptable methods by which knowledge is produced, evaluated and transferred.

Table 2 lists the main disciplines classified within the social sciences and gives a brief outline of each.

Part of the process of developing a social science strategy will be testing out different disciplines and approaches and reflecting upon their usefulness for approaching FCERM problems in order that the social science strategies for each theme can be developed appropriately. Working with the different approaches, theories and methodologies of the different disciplines will be appropriate for different projects. An understanding of these differences within the social sciences and the nature of the knowledge that is being generated and communicated is therefore important. To enable FCERM staff and consultants to understand the different theories of knowledge (epistemologies) a separate discussion document will be produced by the project team.

Table 2 The main disciplines within the social sciences

Disciplines	Brief description	Focus	What does that mean for flood research?
Social Anthropology	Anthropology is the comparative study of cultural and social life. It seeks to understand similarities and differences in societies and cultures and social and cultural systems and relationships. It seeks to understand connections both within and between societies.	Social anthropology focusses on knowledge about humans in society. Original focus was on 'primitive societies' now also studies modern societies and institutions and their development. Emphasis on qualitative description, detailed studies of local life but also global focus; empirical studies; ethnography; participant observation and lengthy fieldwork in particular social settings.	An anthropological approach to flooding could involve studying flooded communities over several years to understand longer term impacts
Economics	Economics is the social science that studies the production, distribution , and consumption of goods and services . The word 'economics' is from the Greek for οἶκος (<i>oikos</i> : house) and νόμος (<i>nomos</i> : custom or law), hence 'rules of the house (hold).'	Scarcity means that available resources are insufficient to satisfy all wants and needs. Absent scarcity and alternative uses of available resources, means there is no economic problem . The subject thus defined involves the study of choice , as affected by incentives and resources.	Assessing the cost and benefits of a range of flood risk management options.
	A definition that captures much of modern economics is that of Lionel Robbins in a 1932 essay : 'the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses.'	Economics has traditionally been organised separately from social research but is indeed a social science.	
Human geography	Geography is the study of the earth's landscapes, peoples, places and environments. It is, quite simply, about the world in which we live. Geography is unique in bridging the social sciences (human geography) with the natural sciences (physical geography). Geography puts this understanding of social and physical processes within the context of places and regions - recognising the great differences in cultures, political systems, economies, landscapes and environments across the world, and the links between them.	Understanding the causes of differences and inequalities between places and social groups underlies much of the newer developments in human geography (RGS).	Examination of the distribution of flood risk and its relationship to inequalities

Psychology	Psychology is the scientific study of people, the mind and behaviour.	Focusses understanding and explaining attitudes, behaviours and action of individuals and groups.	Understanding people's perception of flood risk, developing flood risk communication processes, understanding behaviours in floods
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Disciplines	Brief description	Focus	What does that mean for flood research?
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Planning	Spatial planning is about the understanding of social and spatial process as the basis for action and intervention. Planning promotes integrative and inclusive approaches to policy making and public engagement.	What distinguishes planning from human geography is its focus, not only on 'knowing what' (knowledge of socio-spatial processes), but also on 'knowing how' (how to use that knowledge as a basis for action). Planners specifically seek to connect forms of knowledge with forms of actions in public domain.	Understanding the impact of flood risk on the quality of places. Integrating flood risk management in the process of spatial strategy-making; bringing together various sector policies and focussing on their overall implications for place making/shaping. Taking into account the specificities of places in flood risk management practices. Identifying appropriate use of land and location of new development by taking a holistic view of economic, social and environmental issues, and drawing on all forms of formal and informal knowledge.
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Political science	Political science seeks to systematically describe, analyse and explain collective decision-making and the values and perspectives that underlie it.	Focusses on issues such as the operation of government in the modern state; all forms of politics and political activity; politics as the use of power or the constrained use of social power; power relationships in government; institutional decision-making; theories of the state; political actors and their mental life, meanings, beliefs, values and intentions; behavioural analysis; rational choice; feminism. Uses both quantitative but particularly qualitative methods such as participant observation and intensive interviewing, comparative political analysis.	Examination of how flood risk decisions are made, who takes part in what decisions.
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Social Policy	Social policy is the study of policies which aim to improve human welfare and largely to meet human needs for education, housing, health and social security. It draws heavily on economics,	Social policy research critically evaluates the impacts of social policies on people's lives. Other issues include: welfare systems; equality and justice; social change; community care; public and social administration.	Understanding the impacts of flood risk management policies on different groups in society
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politics, sociology and philosophy.

Sociology	Sociology can be defined as 'a disciplined understanding of society and the social processes that both reproduce and change it' (Bilton et al., 2002). It provides a systematic, sophisticated and disciplined analysis of society. Sociology offers a valuable tool for questioning assumptions about why things are the way they are and why people act in the ways that they do. It seeks to understand and explain society.	Focuses on social structure; social life, relationships, meaning and identities; social divisions; patterns of social exclusion and inequalities; social environments and processes; social agency; social institutions; risk; power, politics and the state, ethnicity and gender issues; social theory; modernity and post-modernity. Uses both qualitative and quantitative research methods. Key writers include: Marx, Weber, Durkheim, Giddens, Bourdieu.	Understanding the development and workings of formal and informal flood risk organisations,
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Disciplines	Brief description	Focus	What does that mean for flood research?
Landscape design	Landscape design is the art of arranging the elements of landform, vertical and horizontal structures, vegetation, water and climate to make good outdoor space.	<p>Landscape design can influence natural, social and aesthetic processes. Outdoor space which is 'good' from one point of view (e.g. social) may be 'bad' from another point of view (e.g. for natural process).</p> <p>Landscape planning has similar objectives to landscape design but is more concerned with public goods than private goods, is larger in scale, longer in duration, and implemented by many contracts rather than one contract. Other associated disciplines include urban design and environmental impact design.</p>	Landscape design can provide input into flood risk management schemes to help achieve appropriate natural, social and aesthetic outcomes.

5. Techniques, methods and approaches in the social sciences

Social scientists deploy a range of approaches to gathering evidence in the study of society, from the collection and analysis of statistics, to the collation of responses to questionnaires and interviews and to the systematic observation of human behaviour (SAC, 2006). Each of the social science disciplines themselves may use a range of approaches. For example, neo-classical economics is just one approach used by economists. These different approaches include:

1. What questions are asked (e.g. focus on understanding different views of the risk of flooding in a village, understanding the relationship between age and the health effects of flooding in the general at risk population, understanding how decisions are made about flood risk management).
2. What methods are used for collecting data (semi-structured interviews, focus groups, structured interviews, self-completion questionnaires, diaries, observation)
3. What is used as data (e.g. people's verbal accounts, documents)
4. How the data is analysed (e.g. using qualitative techniques, statistical tests)
5. How the quality of the research is measured (robustness, reliability, validity, generalisability)

In reality, although each discipline might be associated with a specific approach most disciplines will use the range of approaches. Many of these areas have so far been largely untouched in FCERM research. For example, FCERM professionals know that the decisions that they need to make are political, yet to date the contribution of political science within the R&D programme has been minimal.

Similarly, research questions are often thought of in terms of being quantitative (dealing with numbers) or qualitative (dealing with words), or some combination of the two. Research questions which are considered to be quantitative usually involve development of a hypothesis which can be tested against empirical, quantitative data collected using a deductive process. The quantitative nature of the data enables statistical analysis to test the pre-determined hypotheses. Quantitative research questions then are fixed, developed from theory (deductive) and often describe a relationship between variables in a specific order.

In contrast qualitative research questions are often exploratory in nature, using methods to generate data about the meaning of the topic of interest, and the processes by which it has a social reality. Initial analyses may address tentative questions which emerge and evolve through the process of analysis and interpretation.

The differences in the types of research questions that tend to be addressed using quantitative and qualitative research approaches are summarised below in Table 3, together with some flood related examples.

Table 3 Research Questions in qualitative and quantitative research

	Qualitative approaches	Quantitative approaches
Nature of Research Questions	Topic areas with sub-questions e.g. What was your experience of the recent flood in your village?	Questions, objectives or Hypotheses e.g. It is hypothesized that people who are over 75 will suffer greater health effects from flooding than people between 35 – 50
Aim of Research Questions	Describe the experience: What happened when the river broke its banks? How did you cope with the flood damage? Discover: Why did you ignore the flood warning? Explore a process: Explain or seek to understand: Understanding flood resilient communities	Descriptive: How many people who were flooded suffered health impacts? Comparing groups: What is the difference in terms of response in a flood between those people who receive a flood warning and those people who don't? Explanatory or Causal: Search for causes or effects/ test hypotheses
Properties of Research Questions	Open-ended, research questions may evolve during course of study	Fixed, developed from theory
	Descriptive e.g. describing different experiences of flooding	Can be descriptive, e.g. mapping the relationship between flood risk areas and inequalities.
	Non-directional e.g. aiming to examine the range of different experiences of health impacts of flooding.	Directional - describe a relationship between variables often with a temporal causal ordering e.g. using regression analysis to understand the key variables related to health impacts of flooding.

Developed from (Cresswell, 1994)

6. Project objectives and goals

The above discussion sets out the rationale for this project and outlines how the different social science disciplines could contribute to the FCERM R&D programme. With these in mind the project aims to:

- Develop a vision and facilitate development of a draft strategy for social science research within the FCERM R&D programme for the next 5 years in a way that builds on the understanding of social science research practices and the institutional capacity to apply these from the outset.
- To develop practical understanding and application of social science research practices within the context of the four R&D themes.
- To build institutional capacity for social science research practices by developing and working with a network of 'social science Champions'.
- To identify opportunities to embody the emerging understandings of social science research practice and proposals within relevant strategy, policy and guidance documents.
- To evaluate the whole project and establish a process to ensure post-project sustainability.

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