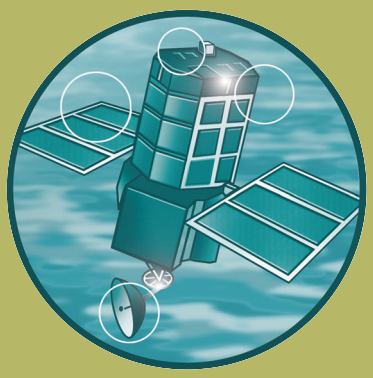
Joint Defra/EA Flood and Coastal Erosion Risk Management R&D Programme

Developing an evidence base for improving appraisal guidance:
Extended Summary

R&D Project Record FD2019/PR1



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

Developing an Evidence Base for Improving Appraisal Guidance

R&D Project Record FD2019/PR1

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1. Introduction

1.1 Aims and objectives of the study

The aim of the study as set out in the project specification is to:

- explore the potential for improvements to the existing project appraisal guidance (Defra 1999-2001) to reflect the findings of the Foresight Study (OST 2004) and the direction of travel identified in the Government's first response to the Making Space for Water (MSfW) consultation (Defra 2005).

The objective of the project is to:

- develop evidence that will allow Defra and the operating authorities to improve guidance and thus assist practitioners make better decisions.

The project specification also gives a series of detailed objectives:

- A: review and obtain structured feedback on existing guidance;
- B: analysis of appraisals undertaken under existing guidance including:
  - level of effort / reliability for different scales of appraisal and consistency of outcome;
  - impact of the decision process and indicative standards;
  - application of climate change allowances and sensitivity tests; and
  - extent to which all significant benefits and costs are included in decision making.
- C: analysis of potential improvements to appraisal procedures including use of scenario approaches to better reflect future changes in decision making and promote adaptability and methods to consider portfolios of measures.

The aims and objectives are to be achieved by undertaking a series of structured tasks designed to generate the evidence needed to identify if changes to the guidance are needed and, if so, what changes, where and how such changes can be made. Furthermore, the study aims to provide a better understanding of the guidance that supports the appraisal process, how it can be improved to contribute to better decisions and be cost effective, in the quest to reduce risk and be consistent with sustainable development principles.

1.2 The guidance covered

The FCERM guidance being considered includes:

- the Flood and Coastal Defence Project Appraisal Guidance (FCDPAG) series, which includes five volumes:
  - FCDPAG1: overview including general guidance;
  - FCDPAG2: strategic planning and appraisal;
  - FCDPAG3: economic appraisal, including the FCDPAG3 spreadsheets;
  - FCDPAG4: approaches to risk; and
  - FCDPAG5: environmental appraisal.
- Shoreline Management Plan guidance (SMP and SMP2);

- Catchment Flood Management Plan (CFMP) guidance Volumes 1 and 2;
- the Multi-Coloured Manual (MCM, new and old versions) and Handbook (MCH); and
- Project Appraisal Report (PAR) Guidance.

The main body of the Final Report focuses on specific issues of the guidance specifically raised in the brief. This Summary Report brings together the key findings and proposed solutions to issues raised, organised to reflect key areas where particular issues were raised.

2. Details of method used and results obtained

The study involves five tasks, which are linked to the detailed project objectives, with the task name identifying which detailed objective it is intended to achieve:

- Task A1: review of guidance documents – this includes not just the current suite of flood and coastal erosion risk management (FCERM) guidance but also guidance documents used in other fields. This task provides evidence in terms of what is currently provided as guidance and alternative approaches to presenting and providing information;

- Task A2: structured feedback – this task has involved the use of initial and detailed questionnaires and workshops to obtain the views of those using and applying the guidance as well as members of the public. This task provides evidence on where there are current problems and explores potential solutions;

- Task B1: review of Project Appraisal Reports (PARs) – 66 PARs have been reviewed to identify what is (and is not) currently included in appraisals and where there are inconsistencies. This provides evidence on what is currently being done and how, with the best sections/approaches used to help identify how potential solutions could be implemented;

- Task B2: review of appraisal processes used in other fields – this task focuses on approaches used elsewhere and how different/similar they are to the approach used in FCERM. The results of Task B2 are used to provide evidence on how the approach used in FCERM could be modified to reduce some of the problems identified in Tasks A2 and B1; and

- Task C: better reflecting future changes and promoting adaptability – this task looks in detail at the use of scenarios, including the need to consider how a scenario-based approach could encourage integration. This is to provide evidence on the potential use of approaches that incorporate scenario analysis.

The results of each task are summarised in a separate task report, with the raw evidence provided as annexes to each task report. Figure 2.1, overleaf, shows how the tasks (and task reports) feed into the Technical Report. This Project Report provides a summary of the findings of the study, which are more comprehensively discussed in the Technical Report.

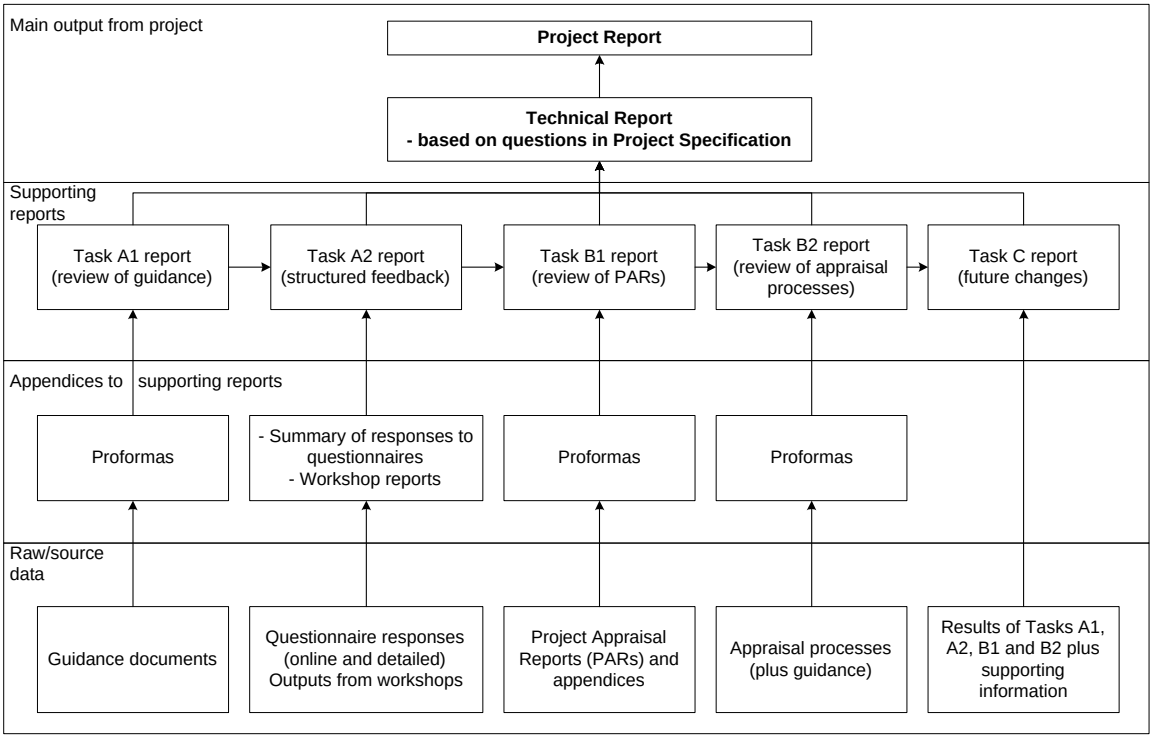

Figure 2.1 Organisation of the outputs of the study

The results of each task are brought together in this report to provide the base evidence in terms of the problems that are currently faced, the causes of those problems and to help identify and justify the proposed solutions.

In terms of reliability of the results of the study it is important to note that the data collected during the consultation phase of the study (Task A2) is, by its very nature, limited to the views of those who responded to the questionnaires or attended workshops. The views of those who were unable to respond to the questionnaire (e.g. due to time constraints) are not represented, hence, there is an inherent limitation of the data. To counteract this limitation, the initial questionnaires were circulated as widely as possible amongst those working in the flood and coastal erosion risk management field. Similarly, care was taken to make the questionnaire for members of the public clear and concise. The workshops were structured in a manner to facilitate free issue raising and discussion and were open to all those who expressed an interest in attending.

Those responding to the questionnaire and attending the workshops were people involved in FCERM, generally with significant experience in the field. Thus, they were able to provide real insight into what they perceived to be the problems with the current guidance, but also beyond this, into the current approaches to appraisal. The project team prepared workshop reports, which summarised all issues raised in the workshop. It was then necessary to sort these comments (also incorporating issues raised through questionnaires and reviews), to identify whether they were related to the guidance itself or to wider issues. Comments on the guidance were then further classified, identifying causes of problems, consequences and solutions and assigning these to appropriate steps within the appraisal process.

Information from the other tasks has been drawn from published and grey literature (Tasks A1, B2 and C) and from a detailed review of completed project appraisal reports (Task B1). The reviews have been undertaken by members of the project team using proformas to record the results such that all reviews have been undertaken in a consistent manner. During development of the task reports, reference was again made to the original sources (guidance documents, reports, PARs, etc.) to both supplement and validate the information included in the proformas.

The questionnaires and workshops focus on problems raised and the causes of those problems, although they did not go into detail as to specific parts of the guidance that are unclear or too complex. This is because the issues being raised were focused on the overall approaches and highlighted that any changes that were likely to be required to the guidance were likely to be more than just amendments to the wording of particular sections or provision of supplementary guidance. As a result, the focus of evidence collection moved from identifying very specific issues with specific parts of the guidance to understanding why there are such major problems (or the perception of major problems).

3. Overview of implications of the findings

The study involved identifying the problems associated with the current suite of guidance, through consultation with users of the guidance (using questionnaires and workshops), reviewing appraisals that have been undertaken (Project Appraisal Reports), and assessing guidance and appraisal processes used in other fields (such as transport, chemical risk management, water quality, etc.). As well as identifying problems, the research focuses on the cause of problems and looks for potential solutions. The input from consultees was invaluable, providing issues arising from hands-on experience but also views on how both the appraisal process and guidance could operate.

The results of consultation showed that some 80% of respondents (to the initial questionnaire) said that they are content with the current guidance. Furthermore, this study demonstrates that the guidance is both in line with Treasury Guidance and should in fact address some of the issues raised during the consultation phase of the study. However, other more detailed evidence collected for this project seems to introduce an inconsistency in this overall picture. At the same time as indicating a general contentment with the appraisal guidance, the evidence shows that:

- there is a quite strongly held belief that things are not working as they should;
- that there is often too much effort going into or expected from PARs; and
- that there is a concern that PARs are not necessarily facilitating the way towards appropriate decisions.

Therefore, it appears that people are not concerned so much with the principle, but rather more with the process.

The problems, causes and solutions have been organised to reflect the area of the appraisal process that they are related to. Figure 3.1, overleaf, presents some of the key issues identified. As well as issues connected to the guidance, wider issues, such as time, resources, skills and knowledge gaps, limitations on data, are also included. The evidence shows that the existing guidance, although fulfilling a need in the past, is limited in scope, has not kept abreast of changes and users do not find it particularly user friendly.

The remainder of this Project Report provides a description of the possible solutions to the issues raised with the guidance documents and wider issues as shown in Figure 3.1. In addition, issues were identified with the current presentation of the guidance where many of the most significant problems relate to navigation through the guidance documents to find the information required and ways of ensuring that you are using the most up-to-date version of the guidance, supplementary notes, etc.

The subsequent sections follow the steps in the appraisal process, as shown in Figure 3.1. Each section is divided into the issues raised, the possible solutions and the proposed future work that would enable the solutions to be implemented.

4. Identify the appropriate level of assessment

4.1 Issues raised

Questions were raised relating to the detail provided by guidance and the consistency in approaches and outcomes from the appraisals themselves. There are issues in terms of both aspects, and further in terms of what an appraisal has to provide. There is also the issue of the guidance not providing full details on an issue such that it could be concluded that a particular area does not have to be covered or should not be covered, even where it may be important in the appraisal being undertaken (e.g. environmental and social issues, sensitivity analysis, etc.).

4.2 Possible solutions and proposed future work

While there are a number of small steps that could be taken to reduce some of the issues, it is likely that the guidance needs to be significantly restructured to address issues relating to the appropriate level of detail that should be used. The small steps could include, for example, developing definitions of what each plan, strategy, etc. is for or implementing an approach to project evaluation. These would address some of the issues but are unlikely to tackle wider issues (e.g. attitudes over the amount of time taken and the costs of appraisal, limited skills), which guidance may not be able to solve on its own, although a complete revision of the guidance could help move towards a new way of thinking about appraisals.

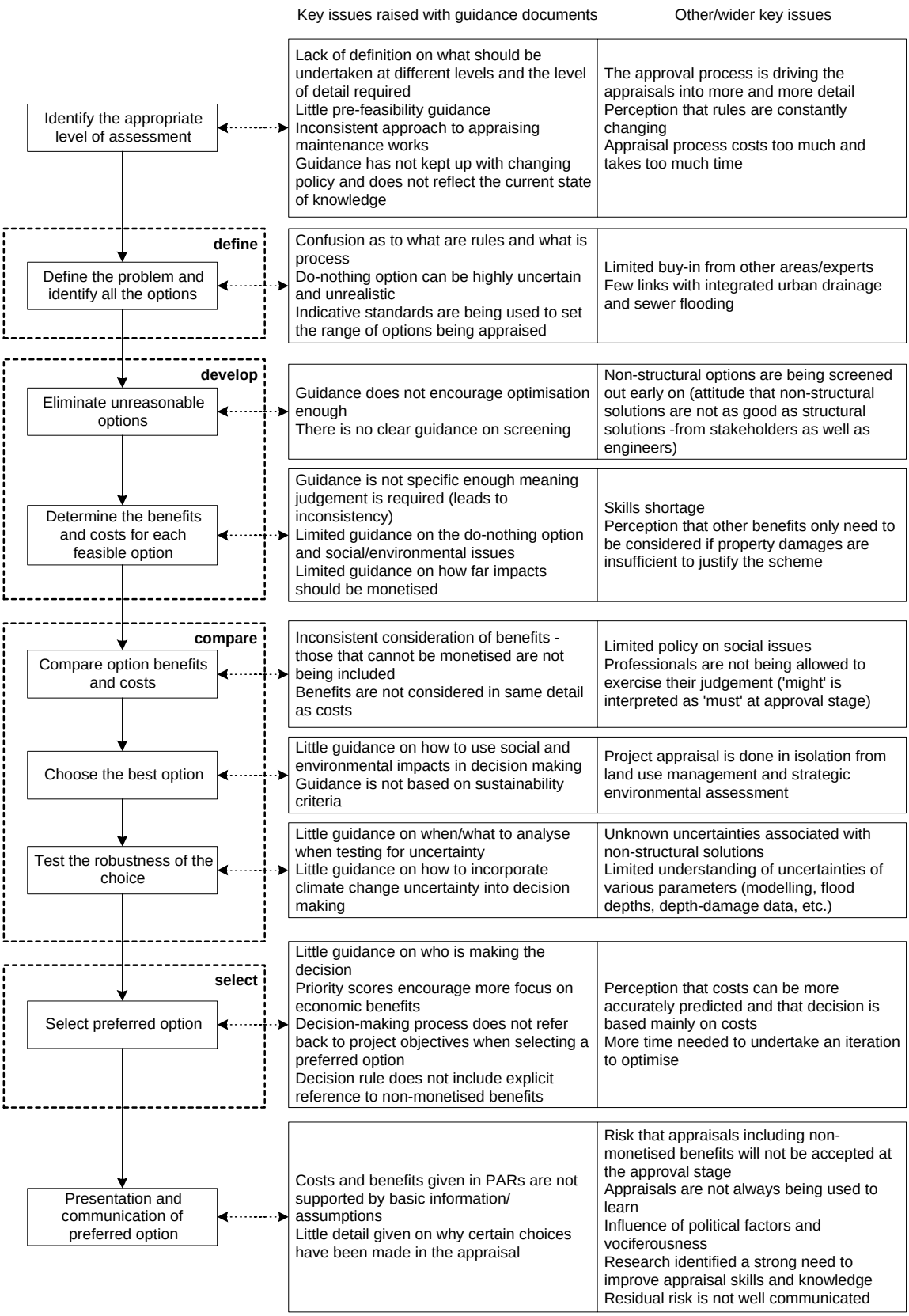

Figure 3.1 Key issues raised in the study

A complete review of how appraisal is undertaken would require a change in emphasis to using appraisal to identify the 'best' (i.e. most sustainable) solution. This would allow the decision-making process to drive the level of detail required, based on the issues that are relevant to the project being appraised. Guidance to meet the change in emphasis would need to be developed in association with those who will be developing, reviewing and approving the appraisals. This allows comments and feedback to be obtained early on, and encourages buy-in to the whole process. Thus, attitudes could be at least partly changed by involving potential users of the new guidance in its developments, and by showing how their concerns have been addressed.

It is important when deciding to add further information that any additional information provided is clear, concise and unambiguous, and avoids an increase in length of the documents. Consideration needs to be given to the potential for consolidation of text to reduce duplication. This could be assisted by the use of online presentation of the guidance, with links between different areas to make it easier for users to find specific information.

There is a need to move towards a similar methodology for appraising maintenance and capital works to provide a consistent approach to asset management. Such a move could also have knock-on benefits by changing the way that maintenance (and the maintain option) is perceived, from the 'worst' of the do-something options to, potentially, a viable and acceptable approach to reducing/managing flood risk.

There is also likely to be a need for a change in approaches and attitudes, not just those undertaking the appraisals, but also those who approve them. This will be assisted by providing new approaches to the appraisal process, tailored by the appraiser to meet the specific requirements of the project. This will not only help identify the appropriate level of detail but should encourage greater transparency. It will be essential that practitioners are willing to justify why they have used a particular approach and this requires approvers to have confidence in the appraisers (and vice versa). Guidance cannot provide this alone, but it can encourage practitioners to draw on their experience and expertise.

5. Define the problem

5.1 Issues raised

The 'do-nothing' baseline and especially the assessment of the impacts over time, the uncertainty of what will happen and the potential for manipulation are all areas of concern. The main problems are related to the lack of guidance on how to assess the do-nothing option, what should be included and the extent to which impacts should be predicted. This includes not only the damages under do-nothing but also the costs that may be incurred but which cannot be taken into account (other than as dis-benefits).

There is a growing body of opinion that 'do-nothing' may not be the most appropriate baseline and do-minimum or present practice should be used,

although this may raise issues of its own in terms of how to describe do-minimum and to ensure consistency between appraisals.

5.2 Possible solutions and proposed future work

Walkway option. The separation of the do-nothing baseline from an option that could realistically be implemented is proposed and this has arisen from experience where there are costs associated with the 'do-nothing' option. This walkaway option would have the same effects as 'do-nothing' but would identify the costs of consultation, dealing with public concern and in extreme cases the costs of re-housing, etc. The use of the walkaway option would help to solve the perception and acceptance problems currently posed by using do-nothing as an option. This is shown in PARs where many of the reports appear to put as much effort into describing why do-nothing is not appropriate as they do in describing the impacts. It does this by providing some 'middle ground' between incurring no costs (which is generally only a theoretical possibility) and providing what could be termed an exit strategy (i.e. it would require timed and programmed action which would incur some cost, but which would be less expensive than doing something). The use of walkaway as an option also enables the appraisal process to consider the full costs of not providing protection in a more transparent manner. This would add an extra option to the appraisal, but is consistent with the Treasury Green Book and could be described as a realistic do-nothing.

Stakeholders. The views of local stakeholders can be taken into account providing a more inclusive basis that could involve consideration of novel approaches and/or encourage contributions such that a do-something option may become economically justifiable. The main risk with using walkaway as an option when it has been shown that there is no economic justification for providing defences is that the local community may already be defensive and may not cooperate. Stakeholders may also be aware that providing additional pressure will increase the costs of walkaway and, thus, the potential that something will be done as it would be less expensive. The timing of stakeholder engagement is likely to be key to ensuring that walkaway is a realistic, implementable option.

6. Identify all of the options

6.1 Issues raised

The causes of the problems associated with the range and type of options being considered in appraisals are wide ranging, from attitudes through available information and guidance, to the availability of time and resources. There is also a human element in that those undertaking appraisals, the project managers, and those approving want to be able to provide the 'best' standard of defence possible. This is understandable particularly where flooding problems have been seen and/or consultation with the local community undertaken. Attendees at the workshop identified that it is not easy to remain totally objective when undertaking appraisals when the problems caused by flooding

have been witnessed. There is a need for greater emphasis on flood risk management and the associated use of non-structural solutions.

6.2 Possible solutions and proposed future work

ASTs. The use of ASTs to allow non-quantified benefits to be included could help, as could the inclusion of impacts such as loss of life or risk of injury. This would help to emphasise differences between structural and non-structural solutions. This is also likely to require additional guidance showing how the benefits of non-structural solutions can be calculated, particularly where their overall success is dependent upon a series of events being completed, e.g. temporary defences. As this is not currently picked up it may suggest that non-structural solutions should be screened out as they have no additional benefits, when in fact they do – they are just not represented through the use of the MCM depth-damage values. This highlights the potential influence of screening and its role as part of the options selection process. It is important that screening forms an integral part of the options selection and revision process but that potentially effective options are not screened out without proper justification.

Non-structural solutions. Non-structural solutions may benefit from inclusion in cost-effectiveness analysis (rather than cost-benefit analysis) as is undertaken in the Netherlands. Such an approach makes the inclusion of non-monetisable benefits (and costs) easier to take into account and would help to encourage combinations of structural and non-structural options to provide the optimal solution. This requires changes to be made in other areas of the appraisal, such as the baseline and the way that costs and benefits are identified, described and valued. Otherwise, the requirement for more options to be assessed will only add to the time and money being spent (which is already perceived as being too high). However, there are also issues in terms of confidence with non-structural solutions that will be difficult to solve through guidance.

7. Eliminate unreasonable options

7.1 Issues raised

Many of the most significant problems associated with the elimination of unreasonable options relate to the way that options are screened, but also to the list of options that is considered in the first place. The majority of PARs reviewed undertook some sort of screening during the appraisal. However, some of those where screening was undertaken did not provide reasons why options had been screened out, or the reasons were not clear/convincing.

Organisational inertia in terms of looking at new, innovative and potentially more sustainable options was one of the issues raised in the questionnaires and discussed in the workshops. The lack of emphasis on environmental and social issues, and reluctance to consider what may be untried and untested approaches lead to such options either not being included in the long-list of options in the first place or being screened out early on.

7.2 Possible solutions and proposed future work

Screening. There is the potential to include a more sophisticated approach to screening where decision-making is based on risk and uncertainty. This could include initial screening of the long-list of options to remove those options that would not meet the project objectives (or the primary objective of reducing flood risk), followed by further screening/refinement of options to move towards a better solution. This begins to move into optimisation of options but in a way that should avoid the need for repeated appraisals. Such an approach could be included within the design of new guidance by including a number of points at which the options are compared (perhaps before deciding to obtain further detail).

Illustrative examples. Illustrative examples taken from completed PARs could be included but care is needed to allow for flexibility in approach. It is also important that any additional guidance is not interpreted as a 'must do', perhaps by giving a range of approaches from simple checklists through to more complex approaches such as multi-attribute techniques. This highlights the importance of providing guidance on 'what' rather than 'how', with the rules specified but the processes (and detail) identified by practitioners according to the specific needs of the project. Making a change to deal with screening issues as part of the option selection and revision process would deal with most of the problems identified above.

Hybrid options. If bits of the options could be combined to provide a hybrid option that maximises the benefits and minimises the costs, it may not be necessary to undertake the more detailed appraisal, thus providing time savings. Such an approach should help address concerns of appraisers that the appraisal process takes too long and costs too much by changing the focus from assessing individual options towards building up an option through the selection/screening/assessment aspects of the appraisal to provide a revised option (or options) that best addresses the requirements of the project. This would help to address the problems raised as being related to screening as part of the overall appraisal process, building screening into the approach in a formal way. It is important that non-structural options are included in the appraisal, and are not screened out on the basis of a lack of confidence in their performance.

8. Determine and compare the benefits and costs

8.1 Issues raised

There is a need to improve consistency in the way that benefits are considered, both in terms of identifying whether a particular impact is likely to occur and to cover all of the economic, environmental and social issues.

Many of the most significant problems in terms of the assessment of costs and benefits relate to inconsistency between appraisals. There are also issues in terms of the appropriate level of detail within appraisals, where a lot of time appears to be spent on obtaining cost estimates (including refinement of optimism bias), but much less apparent effort in terms of benefits. Impacts that cannot be valued in monetary terms are often being completely ignored or overlooked.

The main issue is associated with the perception issues that the decision is likely to be driven by damages to property and that other benefits are likely to be small. This may indeed be the case in many situations and when other benefits are compared against the do-nothing damages. There also seems to be the perception that the choice of preferred option is based on economics only and that other (non-monetised) impacts cannot be included at the decision-making stage. This may be as a result of use of the decision rule in FCDPAG3, which does not explicitly include consideration of non-monetised impacts when selecting the preferred option.

8.2 Possible solutions and proposed future work

ASTs. This is likely to be most easily and transparently addressed through the use of ASTs. The AST can be used as a checklist to make sure that all relevant impacts have been identified and considered, at least in qualitative terms, and to record why impacts determined as not significant have not been assessed in detail. The AST can also be used to record assumptions made when quantifying in money terms those impacts for which monetary estimation is considered appropriate. Care is needed that this is not perceived to be adding to the time and data requirements for an appraisal (otherwise there is a risk that the ASTs will not be used as an integral part of the appraisal process to inform decision-making).

Use of ASTs. The use of ASTs will need to be accompanied by guidance explaining:

- how the categories have been identified: this may be best done by making use of existing ASTs such as those prepared for the MCA or Sugden projects, which incorporate categories from Environmental Impact Assessment/Strategic Environmental Assessment;

- what each category covers: which issues are included and where. This is essential to avoid different interpretations of the categories and to prevent double counting of impacts;

- potential use of the AST as a method showing which impacts are considered relevant to the decision (and have therefore been assessed to detail) and reasons why other benefits are not considered significant (and have been screened out); and

- how each impact could be measured, with examples, including where it may only be possible to describe potential impacts in words. The guidance could

include details of types of information that could be considered, including indicators that could be used to quantify the impacts, plus references to appropriate willingness to pay values that may be applicable (to allow impacts to be expressed in money terms). To make sure that the full range of benefits included in the AST (qualitative, quantitative and monetary) are included when selecting the preferred option (and thus make the additional effort of assessing all of the potential benefits worthwhile), it is likely that changes will need to be made to the decision rule.

9. Test the robustness of choice

9.1 Issues raised

The main changes required in terms of sensitivity analysis include the need to emphasise the importance of understanding the influence of uncertainty on the selection of the preferred option. The main causes of the problems can be linked to a lack of guidance on how to deal with uncertainty, but also to a lack of understanding of what is causing uncertainty in the appraisal process. This needs to be drawn from information on uncertainty associated with key assumptions and data. The key will be to change the focus of the sensitivity analysis so it forms an integrated part of the whole appraisal process. This will require greater emphasis and time to be spent on the sensitivity analysis, and will need a change in attitude towards addressing uncertainty with benefits as well as costs.

9.2 Possible solutions and proposed future work

Uncertainty management. A short-term solution could be provided through the provision of guidance on why sensitivity analysis is undertaken, together with information on the uncertainty associated with key datasets (e.g. depth-damage data). However, this will require additional time and effort, further increasing the cost of appraisals, which are already perceived as being too expensive and time-consuming. Thus, there is a risk that the introduction of a short-term solution only would not result in the required changes to sensitivity analysis and, therefore, would not solve the problems and issues raised during this project. It is also important that provision of additional guidance does not lead to the perception that sensitivity analysis is a 'handle turning' exercise. Any guidance would need to specify the importance of identifying key uncertainties associated with the project being appraised and how those key uncertainties should be investigated. Discussion on 'robustness' of the preferred option to change in key parameters should form an important part of the PAR.

To reduce the risks that short-term solutions are not taken into account, it is likely to be necessary to undertake a major revision of the appraisal process and the accompanying guidance documents. This will help to ensure that sensitivity analysis has a greater influence on the choice of preferred solutions and improve understanding of uncertainty within the appraisals. Such changes may also help encourage the consideration of scenarios (e.g. climate change,

land use changes) by providing a framework into which such uncertainties would more easily fit.

Scenarios. There needs to be a rethink on how appraisals take into account future potential changes such as climate change and land use, and a way of ensuring the most up to date policy is used. To be able to use this information and inform decisions there is a need for much clearer guidance on decision making including incorporating scenarios, uncertainty and linking this with sustainability, adaptation and optimisation. This highlights the need for a complete review and revision of the guidance on aspects such as climate change, socio-economic change and scenario analysis.
This is likely to require further research as the evidence identified in this project highlights that there are few other fields that are currently using scenario analysis in a way that can inform decision-making. Thus, there are no direct analogies from which approaches can be taken and amended to FCERM projects.

10. Select the preferred option

10.1 Issues raised

There are changes that need to be put into place at other points of the appraisal process such that the decision-making process can be made more comprehensive. This can be linked to new approaches as they are introduced such as Multi-Criteria Analysis (MCA) and the Sugden disaggregated benefits and costs methodology. Change management requires careful handling, as currently, the appraisal community will not be experienced with the demands of MCA and integration of MCA with disaggregated approaches.

The problems identified in the study have been found to be not with the decision rule but with the appraisal process as a whole. Common sense usually prevails such that justifications are made for the most appropriate option based on the economic appraisal. However, the lack of consideration of all the benefits means that the most sustainable solutions may not be identified. There is a drive to providing greater and greater standards of protection without full consideration of the environmental and social impacts. Even where an Environmental Impact Assessment has been undertaken, it is rare for the findings to have any influence on the decision other than in terms of mitigation measures. The causes of problems at the decision-making stage are linked to all of the previous stages of the appraisal.

10.2 Possible solutions and proposed future work

Links to new approaches. The introduction of new methodologies and approaches that are currently being researched and trialled by Defra and the Environment Agency gives a platform for making the wide-ranging changes that are likely to be required to the appraisal process. The Sugden 'willingness to pay' approach should help in terms of identifying who will benefit and who

should pay for flood risk management works, while multi-criteria analysis could encourage inclusion of those impacts that are difficult to monetise.

Change management approach. The development of new approaches will require an input beyond improved guidance. Training, development and possibly recruitment of new skills will be necessary within the appraisal community, to incorporate the new approaches.

Review objectives. It is also important that the preferred option can be compared back against the project objectives, with the aim of identifying the extent to which the option meets (or does not meet) each objective. This should already be being undertaken but the review of PARs has shown that it is not, highlighting the need for greater emphasis within the guidance. This will then indicate whether there is a need for iteration, where the selected option can be modified to increase the extent that it meets more or all of the objectives (i.e. optimisation).

11. Presentation and communication of preferred option

11.1 Issues raised

The risks of not providing clear and accessible guidance and appraisal reports is that stakeholders do not feel involved in the decision or do not believe the best solution has been identified. This could result in expensive and long-term discussions and appeals with consequent impacts on the reputation of the Environment Agency, Local Authorities, Defra and the consultants. These findings are supported by responses to the questionnaire for members of the public where only one respondent replied ‘yes’ when asked whether they felt that the appraisal process and the decisions made are logical and understandable.

The guidance only discusses residual risks associated with the preferred option very briefly and does not provide any indication of how to include it (except for CFMPs). If residual risk is not being fully considered in the appraisal process, it becomes impossible to communicate it to stakeholders. This can lead to confusion amongst stakeholders about the level of risk that they are exposed to. Furthermore, the findings of the review of PARs suggest that residual risk is not communicated very well (if at all) and it only seems to be understood in the context of costs.

11.2 Possible solutions and proposed future work

Clearer communications. Communications with stakeholders on the decision being made will require greater transparency on how the appraisal has been undertaken. It will also be important to communicate the issue of risk clearly, particularly where this is included as part of the appraisal process.

The risk of not undertaking such changes to the appraisal process and accompanying guidance is that the option that is implemented is not able to perform as required and where residual risks have not been fully assessed and could (potentially) result in significant social impacts. This is illustrated by Carlisle, which showed the additional effects of flooding on a relatively isolated community. It is essential that lessons are learnt from such events such that future appraisals better consider the potential for significant effects of larger events (particularly those above the design standard). It is only by focusing on risk and uncertainty that such issues can be brought fully into the appraisal process without adding considerably to the time and resources required.

Understanding risk. It is essential that people living near to the defences understand that there is a risk that the defences may fail under certain conditions. This may help to encourage the acceptance of non-structural solutions to support the structural solutions at times of extreme conditions. It is also important that people living in flood risk areas understand the risk.

Greater guidance accessibility. Also essential is ensuring that the revised guidance is accessible to stakeholders as well as practitioners and approvers. This means it needs to be openly available (e.g. Internet based) but it also needs to be understandable and in a form that a local resident, councillor, etc. can understand why the process is being undertaken and how the results are determined.

Residents, in particular, may only need to review the guidance and/or appraisal process once, hence, they need to be able to understand what is being undertaken and why. This links through to community involvement in decision-making which is outside the remit of this project but which is an essential component if the 'best' solution is to be identified. This needs to be coupled with transparent appraisal reports that explain and justify all decisions and assumptions made such that there is confidence and trust of both practitioners and approvers by the local stakeholders.

Residual and extreme risks. Residual risks and extreme events both require a fuller range of impacts to be considered as it is likely to be social impacts that are greatest under the larger events. This needs greater scoping of impact, such as through the use of ASTs, although these may need to be extended from those proposed in other Sections of this report to ensure that the risks of above design events can be captured. However, the probability of extreme events (and uncertainty of modelling) needs to be considered when determining how much time to spend on assessing effects. This requires the appraisal process to be structured around risk and uncertainty, such that more time and effort is spent on those issues that have the greatest influence on decision-making.

12. Presentation of the guidance

12.1 Issues raised

The main problems with current presentation of the guidance relate to difficulties of knowing where to find a specific piece of information and then whether other information on the same subject is included elsewhere. It is evident that there is some confusion between the intent of the guidance to provide a set of good practice principles and tools for undertaking an appraisal, a technical approach to assessing appropriate solutions and decision making, and the required output of this process in terms of its presentation and content for review.

12.2 Possible solutions and proposed future work

The proposed solutions to deal with issues with the current presentation, accessibility and updating of the guidance are to:

- separate the rules from the process and have two separate documents, but which are structured in the same way (based on the steps in the appraisal process). This would help address issues navigation difficulties and would help different users of the guidance identify their particular areas of interest;
- develop tiered guidance providing overview information (similar in principle to the MCH), with additional detail and explanation provided where needed. This would allow users to obtain information according to their level of expertise, with experienced users able to quickly locate key information, but provide additional explanation for those with less experience;
- the issue of hierarchy and links and significant restructuring of the entire guidance suite should be addressed to ensure consistent understanding of overall objectives principles and requirements, while having detailed guidance for each level of decision. This will ensure that appraisal guidance is based on consistent principles, while remaining objective-led;
- to present the information in such a way that it can be easily searched and includes links between appropriate sections of the guidance (most importantly the rules and process). This may be best done using an on-line version of the document with hyperlinks. This could include links to sections of ‘good’ appraisals to act as illustrative or worked examples of specific processes. Such changes could reduce the apparent length of the guidance, hence, improve efficiency of use, encouraging users to refer to the guidance when undertaking appraisals; and
- maintaining the guidance ‘as is’ for a predetermined period (possibly three years), during which time no changes would be made to either the rules or process, but where feedback and comments could be provided in preparation for an official review period. Users would be able to supplement the process guidance with new approaches, but the rules would be set, such that they are followed by all users. This would remove the perception that the rules are constantly changing and allow time for users of the guidance to become familiar with the revisions. Furthermore, concentration on making as clear as possible the ‘what’ and including as much as possible reference to good practice tools and methodologies on the ‘how’ would provide a

better approach to structuring a guidance that will not need changing too often.

Implementing all of these changes would require the guidance to be significantly restructured. There are smaller changes that could be made (such as developing a consolidated index highlighting linkages between guidance documents and making this available on-line). However, this would not provide solutions to all of the issues (e.g. duplication of information, the length of the guidance or the hierarchy). As a result, small changes may only provide short-term solutions with the remaining issues becoming increasingly important over time.

13. Conclusions and recommendations

13.1 Conclusions

Evidence from the review of PARs and consultation (questionnaires and workshops) shows that there are problems with the (non) identification of the project objectives and definition of the baseline that is often accompanied by reasons why it is not appropriate. A wide range of options is usually considered at the outset but screening of options often removes many of the non-structural and/or innovative solutions without comparing the potential environmental and social benefits they may offer. Further problems are introduced when the benefits are being assessed, with these only rarely looking beyond what can be easily monetised or explicitly included in the priority score. The sensitivity analysis is often used mechanically without reference to uncertainty in key assumptions such that the robustness of one option over another is not tested. Finally, the option choice is made using the decision rule which requires some confidence in the appraisal that precedes it.

Furthermore, the hierarchy of the current suite of FCDPAG documents is such that, although it is perceived to run logically from PAG1 through to PAG5, this is not the case. Similarly, tools and techniques are provided in some guidance documents (e.g. FCDPAG3 (economic analysis), FCDPAG4 (risk), FCDPAG5 (environment) and the Multi-Coloured Manual and Handbook). This has resulted in duplication of areas, but also some issues that are not adequately covered leaving practitioners without a clear route to follow. Thus, practitioners have developed their own approaches based on their experience and expertise, which provides flexibility but can introduce inconsistency (e.g. in how the do-nothing baseline is assessed). However, approvers are then requiring specific approaches to be used and reported such that flexibility is lost and it is the approvers who are driving the approach and detail of an appraisal, rather than the requirements of the project itself.

The review of PARs has shown that there is not any one PAR that has all of these problems; indeed, most PARs provide information showing that the approaches used are correct. The review also showed that the appraisals were (often) not transparent, there was limited information on how impacts were considered other than property damages and although it appeared that the ‘right’ option was chosen there was little confidence that it was the ‘best’ option.

Respondents to the questionnaires and attendees at the workshop also highlighted that there are wider issues.

Therefore from the evidence gathered, the existing guidance, although fulfilling a need in the past, is limited in its scope especially on decision making, is not easily updated to keep abreast of changes, and users do not find it user friendly.

Importantly, our findings suggest that issues with the guidance such as: definition of the appropriate level of detail required; limited discussion on the assessment and use of social and environmental impacts; and limited incorporation of changes in policy and process are only some of the problems leading to difficulties with appraisals. There are also some very important wider (non-guidance related) issues. These include time, resources, skills, limitations on data, uncertainty in data, difficulty of measuring some benefit types, difficulty of bringing non-money benefits into appraisals, organisational inertia and human nature of wanting to provide/justify the best standard possible for the people living in their project area.

13.2 Recommendations for future work

Guidance related solutions proposed include:

- developing separate (but linked) guidance for Defra policy and tools and techniques used in the process. Defra and the Environment Agency have already started this;
- a change of emphasis to the appraisal process is required to provide the 'best' solution that is optimal, sustainable and adaptable (building on the initiatives in MSfW);
- there needs to be a much wider scoping and screening of all impacts at an early stage to target effort to where it is most needed so that the appraisal is efficient and effective. This will help ensure that the decision is based on the most important drivers and the appraisal is based on addressing risk and uncertainty;
- guidance should be tiered to take account of the differing needs of the different levels of appraisal and the different skills of those using the guidance. Defra and the Environment Agency are planning to explore this;
- all guidance should be easily accessible, searchable and updatable. Defra and the Environment Agency are already aiming at this, as shown by the example of this is the recent Multi-Coloured Handbook;
- the decision to invest should be at a strategic level with the implementation through schemes that are appraised against cost-effectiveness, sustainability and optimisation, with identification of which baseline (do-nothing, do-minimum, continue current practice) is most appropriate at the different levels. The implication of this for both Defra and the Environment Agency need to be investigated further; and
- there needs to be a strong understanding of the link between the appraisal and the approach to prioritisation.

‘Wider solutions’ proposed include:

- the wider challenge of addressing the diverse range of skills and competencies of appraisers, to ensure that they have the relevant expertise and understanding. This cannot be achieved by changes to the guidance alone. Other solutions will need to include training, mentoring and networking.

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