

Defra Evidence and Analysis Series

Paper 5

**Social Impacts and Wellbeing:
multi-criteria analysis
techniques for integrating non-
monetary evidence in valuation
and appraisal**

**A discussion of current
approaches and opportunities**

**A paper for the Social Impacts
Taskforce**

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December 2011



**Government
Economic
Service**

Social Impacts Taskforce



The views expressed in this paper are solely those of the authors and do not necessarily represent those of Defra or affiliated organisations.

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PUBLISHED BY THE DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS

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1. Introduction

Background

Social impacts and the consequences of policies for wellbeing have been acknowledged by the Prime Minister as essential to measuring how lives are improving, in addition to the established indicators of economic progress. This emphasis on quality of life - and its relation to how the economy grows - is central to the new independent measures of national wellbeing, that are being developed by the Office of National Statistics (ONS), and commensurate work, led by the Cabinet Office, to understand how government policies contribute to wellbeing. Assessing the social, as well as the economic and environmental, impacts of policies at the appraisal stage is therefore critical, and it is the Prime Minister's view that taken together initiatives such as these 'may be the most quietly radical things this government is doing'¹. This approach requires a systematic way of taking into account all of the impacts that policies are likely to have on individuals, communities or societies. Measuring subjective wellbeing at a national level will give some indication of how satisfied people feel overall. Government needs a balanced framework of subjective and objective measures of wellbeing if policy is going to deliver positive social impacts. Indicators and measures that are more directly linked to departmental policies are, therefore, essential to understanding how social impacts, arising from government action, affect people's lives, and, in turn, how that evidence can be integrated into the way government designs policy.

Sustainability, social impacts and wellbeing

This paper addresses how to assess and integrate evidence of social impacts and wellbeing into valuation and appraisal using multi-criteria analysis (MCA). It draws on the HMT Green Book² guidance on appraisal and evaluation, which describes MCA as '[T]he most common technique used to compare both

¹ Prime Minister's speech on 'Building a bigger, stronger society', 23rd May 2011 -

http://www.conservatives.com/News/Speeches/2011/05/David_Cameron_Building_a_bigger_stronger_society.aspx

² HM Treasury (2003). The Green Book: appraisal and evaluation in Central Government. Stationery Office, London. http://www.hm-treasury.gov.uk/data_greenbook_index.htm

unvalued costs and benefits' (HMT, 2003; 35), the HMT Magenta Book³ guidance on evaluation, the Social Impact Taskforce's work, as well as Defra's, and wider work, on environmental valuation.

The environmental policy area is an example where considerable effort has been invested over a few decades to expand the boundaries of policy assessments beyond market impacts. Recent landmark studies such as The Economics of Ecosystems and Biodiversity (TEEB)⁴ and the UK National Ecosystem Assessment (NEA)⁵ have demonstrated that reflecting the full value of the natural environment in policy decisions is essential for prosperity and wellbeing, now and in the future. This is also UK Government policy as set out in the 2011 Natural Environment White Paper⁶. In order to accomplish this we are using, and developing, a range of tools and techniques that can add value in different circumstances. Economic valuation techniques are now well established, and have an essential role to play for incorporating the value of marginal changes in environmental quality or ecosystem services in social cost-benefit analysis. However, too often, when valuation is not applied to them the implicit value attributed to social or environmental impacts is zero. In some cases, monetary valuation alone cannot provide a meaningful or complete picture of the costs or benefits of a given policy change and the use of non-monetary evidence may be more appropriate. For example, there are limits in our understanding of the links between biodiversity and the ecosystem service it provides, as well as limits to our capacity to value biodiversity as a service in itself.

Defra has been developing plural approaches to environmental valuation, at least since publication of our introductory guide for valuing ecosystem services, which argued that '[T]he choice is not a case of either economic or non-economic valuation methods but of using a combination of both, as required by the context of the decision' (Defra, 2007; 35⁷). We have taken this forward more

³ HM Treasury (2011). The Magenta Book: guidance for evaluation. HM Treasury, London.

<http://www.hm-treasury.gov.uk/magentabook>

⁴ <http://www.teebweb.org>

⁵ <http://uknea.unep-wcmc.org>

⁶ HM Government (2011). The Natural Choice: securing the value of nature. London, Stationery Office. <http://www.defra.gov.uk/environment/natural/whitepaper>

⁷ Defra (2007). An introductory guide to valuing ecosystem services. Defra, London.

<http://www.defra.gov.uk/environment/natural/ecosystems-services/valuing-ecosystem-services>

recently through our review of participatory and deliberative approaches to valuation (Fish *et al.*, 2011a⁸), the NEA, and our work on a natural capital asset check, one of the commitments in the recent Natural Environment White Paper (HM Government, 2011; 36).

Methods for taking better account of the social impacts and the wellbeing implications of a broader range of policies have many similarities with techniques needed for environmental valuation. Many aspects of social impacts and wellbeing do not have ready market values and are difficult to measure, and policy actions taken now may play out over long periods of time. As part of their work on measuring national wellbeing, ONS is developing multi-dimensional measures of wellbeing, fairness and sustainability^{9,10}. Other key wellbeing literature, such as the Stiglitz report (2009)¹¹, also views sustainability as central to wellbeing. Techniques developed for environmental valuation are, therefore, directly relevant to assessing social impacts and the consequences of policies for wellbeing.

A key issue for policy appraisal is that policy makers need robust evidence linking social impacts and wellbeing with particular policy interventions, and to be able to demonstrate causal links and attribution. This is a particular challenge that is likely to need both quantitative and qualitative approaches. New evidence can be collected at appraisal stage, but will also need to draw on evaluations of previous interventions. The required body of evidence linking social impacts and wellbeing to detailed policy interventions is likely to take a significant period of time to establish, although quick wins should be identified and maximum use made of existing evidence. The principles and methods set

⁸ Fish R, Burgess J, Chilvers J, Footitt A and Turner K (2011). Participatory and deliberative techniques to support the monetary and non-monetary valuation of ecosystem services: an introductory guide. Defra Project Code NR0124. Defra, London.

<http://randd.defra.gov.uk/Document.aspx?Document=NR0124.pdf>

⁹ ONS (2011a). Measuring national well-being: measuring what matters. National Statistician's reflections on the National Debate on Measuring National Well-being. ONS, Newport.

<http://www.statistics.gov.uk/articles/nojournal/ns-report-eng.pdf>

¹⁰ ONS (2011b). Measuring national well-being - discussion paper on domains and measures. ONS, Newport. http://www.ons.gov.uk/ons/dcp171766_240726.pdf

¹¹ Stiglitz J, Sen A and Fitoussi J (2009). Report by the Commission on the Measurement of Economic Performance and Social Progress. http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf

out in the HMT Magenta Book will be useful in the design of data collection tools in policy appraisal as well as in policy evaluation.

In Section 2, this paper discusses frameworks for understanding and assessing social impacts and the consequences of policies for wellbeing, drawing on the framework developed by the GES and GSR Social Impacts Taskforce for understanding how the social impacts of policy sit alongside other policy impacts. In relation to wellbeing, the paper discusses the national debate on wellbeing initiated by ONS, and their ongoing work to develop domains and indicator sets to measure national wellbeing.

Techniques for integrating non-monetary evidence

While monetisation of impacts of policies is the focus of the Green Book, it is also clear that 'wider social and environmental costs and benefits for which there are no market prices also need to be brought into any assessment' (HMT, 2003; 19). The updated version of the Green Book (HMT, 2011; 57) describes the role of the valuation of non-market impacts as 'challenging but essential' and provides an overview of techniques for valuing non-market impacts, drawing on Fujiwara and Campbell's (2011)¹² discussion paper. Both the market based approaches – stated preference and revealed preference – and the other approaches, including life satisfaction – are techniques that focus on estimating monetary values. They allow comparison of the impact of non-market goods or services across policy areas. Fujiwara and Campbell (2011) provide a comprehensive assessment of these economic techniques, their applicability and limitations. They describe the preference-based approaches as being 'based on the premise that people have well-defined pre-existing preferences and values for all goods and services' (p.10), and contrast this with the non-preference approach – Life Satisfaction – which 'estimates the value of non-market goods by looking at how they impact on people's reported well-being' (p.10). The Green Book suggests that, as it is an evolving method, subjective wellbeing measurement used in the life satisfaction approach, is not yet robust enough for using in social cost-benefit analysis. However, it does state that it will be

¹² Fujiwara and Campbell (2011). Valuation techniques for social cost-benefit analysis: stated preference, revealed preference and subjective well-being approaches. A discussion of the current issues. HM Treasury and DWP, London. http://www.hm-treasury.gov.uk/d/green_book_valuationtechniques_250711.pdf

important in 'ensuring that the full range of impacts of proposed policies are considered' (p.58) and 'give us a better idea of the relative value of non-market goods' (Fujiwara and Campbell, 2011; 5). Work across government on non-market social impacts and wellbeing aims to strengthen measurement to improve social cost-benefit analysis and decision-making.

Even where monetisation of non-market goods is possible, significant uncertainty may remain. Uncertainty may be inevitable due to the nature of the impacts (e.g., climate change impacts), or may result from difficulty in designing research methods and instruments that enable impacts to be identified and monetised with confidence. Large ranges for monetised impacts limits their usefulness in policy appraisal and/or development. In these cases, non-monetary evidence can complement monetary approaches, to give a broader, more comprehensive, assessment.

It is worth noting that non-monetised impacts have been incorporated into recent Regulatory Policy Committee guidance (RPC, 2011; 21¹³) which states 'We will Green flag an IA if the non-monetised impacts are assessed using established techniques and frameworks' The guidance describes such techniques as including, for example, 'Appraisal Summary Tables, Scoring and Weighting, or Multi-Criteria Analysis'.

In Section 3, this paper proposes a framework for integrating non-monetary evidence in social impacts and wellbeing valuation and appraisal. The approach has the following key elements:

- A multi-criteria analysis framework
- Identification of key social impacts and wellbeing domains and indicators relevant in the specific policy context, including those beyond the immediate policy area
- More systematic and integrated use of quantitative and qualitative evidence
- Enhanced stakeholder participation and deliberation
- Proportional approach, including light touch techniques

¹³ RPC (2011). Rating Regulation: An independent report on the analysis supporting regulatory proposals, January-June 2011. RPC, London.

<http://regulatorypolicycommittee.independent.gov.uk/wp-content/uploads/2011/09/Rating-Regulation-July-2011-FINAL-A.pdf>

The section provides an overview of multi-criteria analysis, taking CLG's *Multi-criteria analysis: a manual*¹⁴ as its starting point, and proposes a five-step multi-criteria approach suitable for social impacts and wellbeing valuation and appraisal. The five steps include paying particular attention to identifying and integrating quantitative and qualitative evidence. Enhanced stakeholder participation and deliberation can be included at any stage, or throughout the process.

Drawing on the review by Fish *et al.* (2011a) and a report by Stagl (2007)¹⁵, Section 3 of the paper also provides an overview of a range of specific MCA techniques which enable monetary and non-monetary expressions of value to be integrated, which all incorporate different forms of stakeholder engagement and deliberation, and which offer potential in different social impacts and wellbeing valuation and appraisal contexts.

The section also discusses selected other tools to aid social impacts and wellbeing valuation and appraisal, including logic models, distributional analysis and segmentation.

Participatory and deliberative monetary valuation

Section 3 of the paper is primarily concerned with improving the use of non-monetary evidence in social impacts and wellbeing valuation and appraisal, and with integrating monetary values and non-monetary evidence. However, some of the participatory and deliberative techniques discussed can also be used primarily to derive monetary values, and Section 4 provides an overview of some of these approaches.

The paper highlights findings from the review by Fish *et al.* (2011a) and the shared values chapter of the NEA (Fish *et al.*, 2011b¹⁶). These emphasise that

¹⁴ CLG (2009). *Multi-criteria analysis: a manual*. CLG, London.

<http://www.communities.gov.uk/publications/corporate/multicriteriaanalysismanual>

¹⁵ Stagl (2007). SDRN Rapid Research and Evidence Review on emerging methods for sustainability valuation and appraisal. A report and briefing to the Sustainable Development Research Network. SDRN, London. <http://www.sd-research.org.uk/reviews/valuation.php>

¹⁶ Fish R, Burgess J, Church A and Turner K (2011). Shared values for the contributions ecosystem services make to human well-being. In: UK National Ecosystem Assessment. The UK National

deliberative monetary valuation can be used to elicit individually based values, as in conventional stated preference techniques, but deliberative group-based methods can also be used to elicit shared or social values. The paper notes that while deliberative group-based techniques offer potential in this regard, some of the concepts and approaches need to be refined further, and additional work is required to test their application in different contexts.

Key challenges, conclusions and case studies

Some of the challenges in taking forward the methods discussed in the paper are presented in Section 5, and some conclusions drawn in Section 6.

Selected case studies illustrating a range of the techniques discussed are presented in Annex 2. Overall, the case studies demonstrate the practical application of a multi-criteria analysis framework, and illustrate a range of ways in which diverse forms of evidence can be integrated in valuation and appraisal of social impacts and the consequences of policies for wellbeing. Together, they highlight ways in which enhanced stakeholder participation and deliberation can contribute to the framing of policy issues, weighting of criteria, and refining and improving options, as well as assessing performance across different objectives using monetary values and non-monetary evidence.

Some definitions of key terms used in this paper are shown in Box 1.

Box 1 Definitions of key terms used in this paper

What is multi-criteria analysis?

MCA techniques are wide ranging, although the basic method involves a structured approach to differentiating between a range of options, based on a set of objectives or criteria, against which each option is assessed. MCA techniques can be used to address a wide range of problems, and at different stages of the policy process. For example, MCA is often used to screen a range of options at an early stage of analysis before more detailed assessment, but it can also be used as a detailed appraisal technique. In contrast, cost benefit analysis comprises a more similar set of approaches (CLG, 2009¹⁷).

What is a stakeholder?

The term 'stakeholder' is used in this paper to refer to any individual, group or organisation who is directly or indirectly affected by an issue, or who could affect the outcome of a decision-making process (Stagl, 2007¹⁸). This is likely to include policy and decision-makers, and may include a range of specialists, as well as representatives from external public, private, voluntary and community sector organisations. Stakeholders to be involved in social impacts and wellbeing valuation and appraisal may also include citizens who do not have a formal role in any of these organisations (Fish *et al.*, 2011a¹⁹).

What is participation?

The term 'participation' is sometimes used to refer to any mechanism which is intentionally designed to allow stakeholders to be involved in decision-making (Stagl, 2007). However, this paper uses the definition proposed by Fish *et al.* (2011a; 16), who argue that to be considered participatory, an engagement process 'should involve some exchange, interaction and reciprocity of information and ideas between stakeholders and those responsible for the decision process'. In this sense, Fish *et al.* also distinguish participatory processes from information dissemination and desk based processes.

¹⁷ CLG (2009). See 14

¹⁸ Stagl (2007). See 15

¹⁹ Fish *et al.* (2011a). See 8

What is deliberation?

Deliberation is defined as discussion and careful consideration of reasons for and against (Stagl, 2007). Bohman (2000, cited in Davies and Burgess, 2004; 350²⁰) states that deliberation is 'joint social activity, embedded in the social action of dialogue - the give and take of reasons. But more than that, it is a joint co-operative form of social action'. Davies and Burgess (2004) identify fairness as one of two fundamental principles for effective deliberation, in terms of the inclusion of as wide a range of voices as possible; the other is competence, which refers to the capacity of participants to contribute and assess knowledge claims. A deliberative valuation and appraisal method will often involve participants coming together on more than one occasion for group debate and shared learning. Examples include deliberative monetary valuation and deliberative multi-criteria analysis (Fish *et al.*, 2011a).

²⁰ Davies and Burgess (2004). Challenging the 'view from nowhere': citizen reflections on specialist expertise in a deliberative process. *Health & Place* 10, 4, 349-361

2. Frameworks and indicators for assessing social impacts and wellbeing

This section discusses a range of recent frameworks of wellbeing that have informed the current work being carried out by the Office for National Statistics. In relation to social impacts, the section discusses the framework developed by the GES and GSR Social Impacts Taskforce for understanding how the social impacts of policy sit alongside other policy impacts.

2.1 General wellbeing frameworks

In 2008, the *Commission on the Measurement of Economic Performance and Social Progress* was set up. This Commission, led by Nobel Prize winning economist Joseph Stiglitz, published a report recommending improvements to measures of economic performance, fuller measurement of environmental issues and the collection of objective and subjective data on wellbeing. The Stiglitz report (Stiglitz *et al.*, 2009²¹) emphasises that a multi-dimensional definition of wellbeing should be used. In surveying a range of academic research and of initiatives developed around the world, the report recommends the consideration of the following dimensions of wellbeing:

- Material living standards (income, consumption and wealth)
- Health
- Education
- Personal activities including work
- Political voice and governance
- Social connections and relationships
- Environment (present and future conditions)
- Insecurity, of an economic as well as a physical nature

A key component of the report is the emphasis on the importance of both objective and subjective dimensions of wellbeing. Specifically, the authors note that the information relevant to valuing quality of life goes beyond people's self-reports and perceptions to include measures of their 'functionings' and

²¹ Stiglitz *et al.* (2009). See 11

freedoms (e.g., Sen, 1985; Anand *et al.*, 2009). The report suggests that what really matters are people's capabilities, that is, the extent of their opportunity set, and their freedom to choose the life they value from amongst this set (Stiglitz *et al.*, 2009; 15).

The functionings discussed in the report are defined as the states and activities constitutive of a person's being. These include: being healthy, having a good job, being safe, being happy, having self-respect, being calm. The Stiglitz report states that the choice of relevant functionings and capabilities for any quality of life measure is a value judgment (as opposed to a technical exercise), and highlights that assessment of these functionings requires both objective and subjective data.

Recent work by the OECD, which draws on the Stiglitz report, has put forward a framework for wellbeing which distinguishes between three key components: material living conditions, quality of life and sustainability of wellbeing over time (OECD, 2011a²²; 2011b²³). This framework is set out in Figure 1. Beneath the level of headline indicators, the OECD discusses a wide range of other indicators, data and issues that are important to wellbeing but where data may not be available at present for an OECD indicator.

Key aspects of this framework include the idea that a complete picture of wellbeing takes into account not only average levels of wellbeing, but also how this wellbeing is distributed between different groups in society. The framework also takes a capitals approach to the sustainability of wellbeing, suggesting that natural, economic, human and social capital are all required to sustain wellbeing over time.

Beneath overarching frameworks such as this, a capabilities approach is flexible in terms of the precise set of functionings required for a 'good' human life. Sen (1993) argues against attempts to produce a complete list of functionings. He suggests that assessment of the relevant functionings and capabilities that make up our lives does not require there to be a preset agreement on the relative

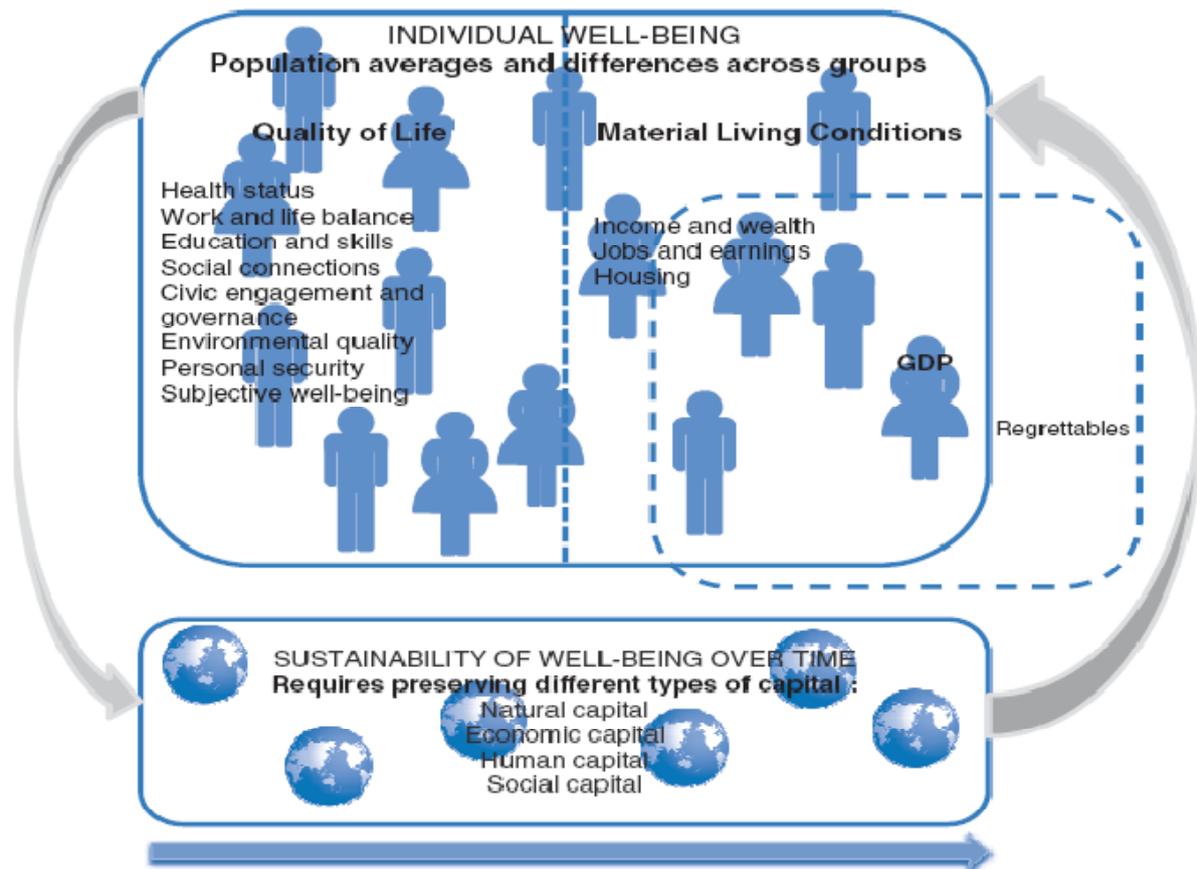
²² OECD (2011a). Compendium of OECD well-being indicators. OECD, Paris.

<http://www.oecd.org/dataoecd/4/31/47917288.pdf>

²³ OECD (2011b). How's life?: measuring well-being. OECD, Paris. http://www.oecd-ilibrary.org/economics/how-s-life_9789264121164-en

values of the functionings or capabilities, or on a particular procedure for deciding upon such values.

Figure 1 Framework for OECD wellbeing indicators



Source: OECD (2011b; 19)

However, in a public policy context, it may be appropriate to develop more indicative sets of functionings and capabilities relevant to particular policy domains. For example, the Equalities Review (2007)²⁴ used the capabilities approach to develop a framework for assessing equality. The framework they put forward included 73 capabilities people feel it is most important they are enabled to do, under broad headings such as: the capability to enjoy individual, family and social life; the capability to engage in productive and valued

²⁴ Equalities Review (2007). Fairness and freedom: the final report of the Equalities Review. Equalities Review, London.

<http://webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/equalitiesreview/>

activities; the capability of knowing you will be protected and treated fairly by the law; and the capability to participate in decision-making, have a voice and influence (for the full list of 73 capabilities under ten broad headings see Equalities Review, 2007; 127-129).

2.2 UK-based frameworks of wellbeing

The New Economics Foundation (NEF) dynamic model

The New Economics Foundation (NEF, 2008a²⁵; 2011²⁶) set out a dynamic model of wellbeing as part of the Government Office for Science Foresight report on mental capital and wellbeing and have further developed this approach (see Figure 2 below). The model looks at wellbeing in its broader context and emphasises the reciprocal relationships between different components of overall wellbeing.

The dynamic model of wellbeing clarifies the relationship between functioning and hedonic approaches to wellbeing by showing how having good overall feelings (and a positive evaluation of those feelings) is *dependent on* functioning well, and on having the external and internal resources to do so.

A key recommendation from this approach is that any account of wellbeing should include the assessments of robust indicators for *all four* of these areas in order to understand human well-being fully. They stress that measures should not focus disproportionately on the top section of the model (life satisfaction) to the exclusion of the middle section (functioning and needs satisfaction). This is in line with other approaches to wellbeing that suggest that resilience is a key component of flourishing (e.g., Seligman, 2011²⁷).

²⁵ NEF (2008a). Measuring well-being in policy: issues and applications. NEF, London.

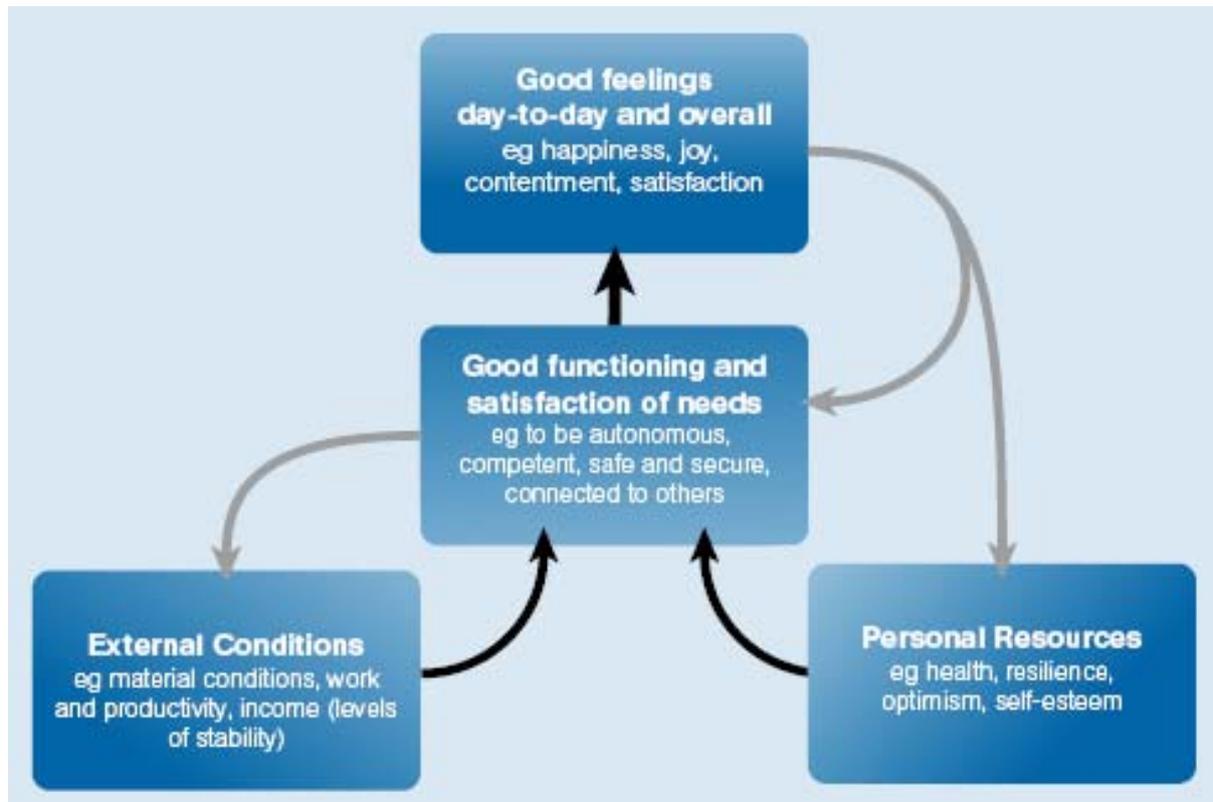
<http://www.neweconomics.org/publications/measuring-well-being-in-policy>

²⁶ NEF (2011). Measuring our progress: the power of well-being. NEF, London.

<http://www.neweconomics.org/publications/measuring-our-progress>

²⁷ Seligman M (2011). Flourish: a new understanding of happiness and well-being - and how to achieve them. Nicholas Brealey Publishing, Boston

Figure 2 NEF's dynamic model of wellbeing



Source: NEF (2011; 13)

Wellbeing framework being developed by Office for National Statistics (ONS)

In 2010, the UK Office for National Statistics (ONS) launched a programme of work on measuring national wellbeing. In addition to taking on board recommendations from past work on frameworks of wellbeing, they also initiated a national debate on wellbeing to gather views on what matters to people and what influences their wellbeing. The initial findings of this debate were published in July 2011 (ONS, 2011a²⁸). The debate highlighted that the things that matter the most to people in the UK are their health, relationships, work and the environment. These are also themes that the majority of UK respondents agreed should be reflected in a measure of national well-being, with the addition of education and training and an additional common underlying theme of fairness and equality.

²⁸ ONS (2011a). See 9

Work is ongoing at ONS and across Government to develop domains and indicator sets that relate to each of the key themes identified in the National Wellbeing debate, based on existing indicators where possible (ONS, 2011b²⁹). In addition to this, the ONS have added four new questions to the Integrated Household Survey (IHS) since April 2011 that are designed to measure subjective wellbeing:

- Overall, how happy did you feel yesterday?
- Overall, how satisfied are you with your life nowadays?
- Overall, how anxious did you feel yesterday?
- Overall, to what extent do you feel the things you do in your life are worthwhile?

These questions are also being tested by being included in other surveys (e.g., Civil Service People Survey 2011).

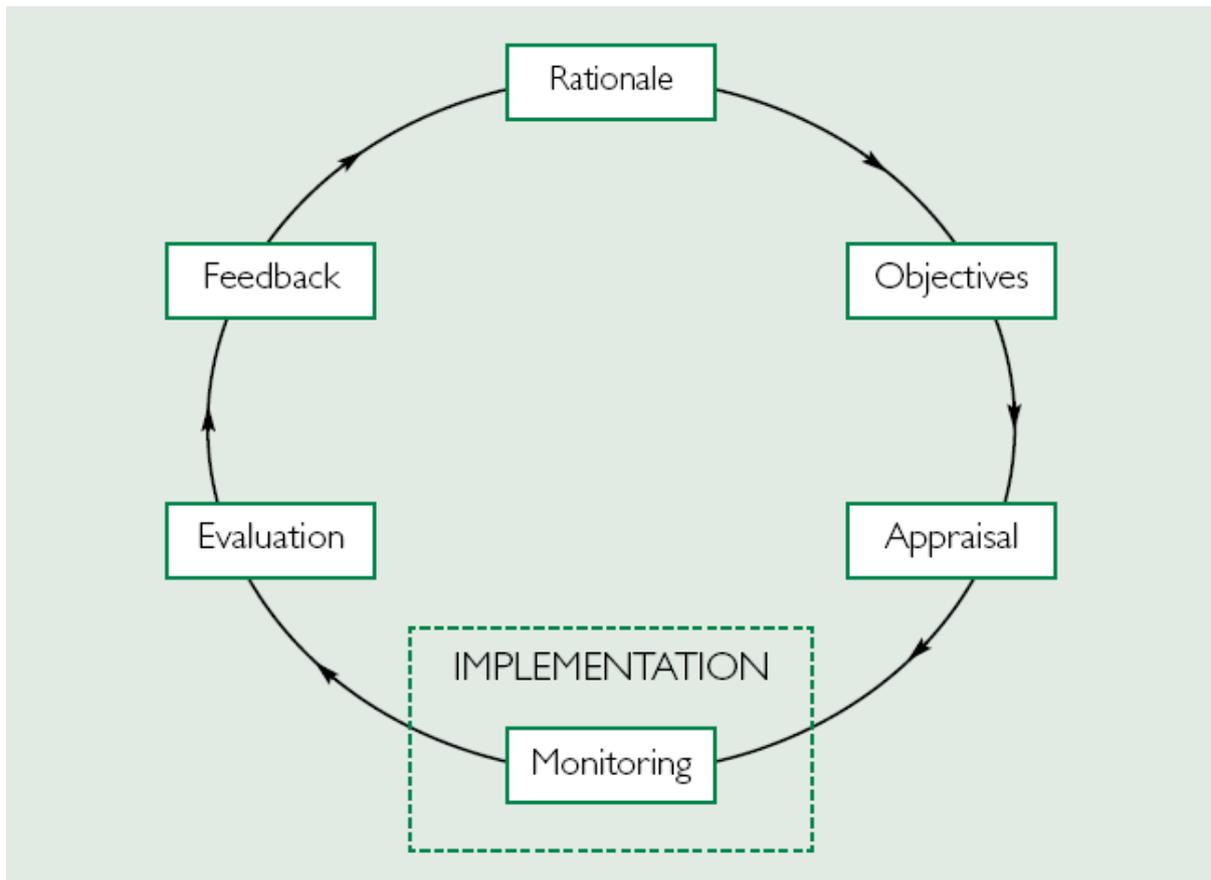
2.3 Including wellbeing in the policy cycle

Once measures of wellbeing are developed, the next step is in integrating the use of this information into the policy cycle within Government Departments, which provides a common framework for policy making. The HMT Green Book (2003)³⁰ describes the key stages of the policy cycle in the acronym ROAMEF (Rationale; Objectives; Appraisal; Monitoring; Evaluation; and Feedback). The ROAMEF cycle is illustrated in Figure 3 below.

²⁹ ONS (2011b). See 10

³⁰ HM Treasury (2003). See 2

Figure 3 The ROAMEF cycle



Source: HM Treasury (2003; 3)

A previous paper published by ONS (Dolan *et al.*, 2011³¹) set out three uses for any measure of wellbeing: 1. Monitoring progress; 2. Informing policy design; and 3. Policy appraisal. This paper also distinguishes between three broad types of subjective wellbeing measure: 1. Evaluation (global assessments); 2. Experience (feelings over short periods of time); and 3. 'Eudemonic' (reports of purpose and meaning, and worthwhile things in life). The table below summarises the recommended measures for each policy purpose. Dolan *et al.* set out three main recommendations:

- Routine collection of data in columns 1 and 2
- All government surveys should collect column 1 as a matter of course

³¹Dolan P, Layard R and Metcalfe R (2011). Measuring subjective well-being for public policy. ONS, Newport. http://www.statistics.gov.uk/articles/social_trends/measuring-subjective-wellbeing-for-public-policy.pdf

- Policy appraisal should include more detailed measures

The Dolan *et al.* report suggests more detailed questions and approaches for cells in this table.

Table 1 Recommended subjective wellbeing measures for each policy purpose

	Monitoring progress	Informing policy design	Policy appraisal
Evaluation measures	<ul style="list-style-type: none"> • Life satisfaction 	<ul style="list-style-type: none"> • Life satisfaction • Domain satisfactions e.g.: relationships; health; work; finances; area; time; children 	<ul style="list-style-type: none"> • Life satisfaction • Domain satisfactions • Detailed 'sub'-domains • Satisfaction with services
Experience measures	<ul style="list-style-type: none"> • Happiness yesterday • Worried yesterday 		<ul style="list-style-type: none"> • Happiness and worry • Affect associated with particular activities • 'Intrusive thoughts' relevant to the context
'Eudemonic' measures	<ul style="list-style-type: none"> • Worthwhile things in life 		<ul style="list-style-type: none"> • Worthwhile things in life • 'Reward' from activities

Source: Dolan *et al.* (2011; 2)

A key issue for policy appraisal is that policy makers need robust evidence linking social impacts and wellbeing with particular policy interventions, and to be able to demonstrate causal links and attribution. This is a particular challenge and will need quantitative and qualitative approaches. New evidence can be collected at appraisal stage, but will also need to draw on evaluations of

previous interventions. The required body of evidence linking social impacts and wellbeing to detailed policy interventions is likely to take a significant period of time to establish, although quick wins should be identified and maximum use made of existing evidence. The principles and methods set out in the Magenta Book (HMT, 2011³²) will be useful in the design of data collection tools in policy appraisal as well as in policy evaluation.

2.4 Drivers of wellbeing

In order to link wellbeing with particular policy interventions, we need to consider not only the wider societal measures of wellbeing mentioned above, but also the drivers that contribute to those measures. A closer analysis of the data being collected by ONS, which include many indicators under each of the key domains of wellbeing identified in the national consultation, may help tease out the relative importance of different drivers of wellbeing, their links to specific policy areas, and how they differentially affect various segments of the population.

Charles Seaford from NEF's presentation at a panel discussion on measuring national wellbeing on 29th September 2011 (Seaford, 2011³³) highlighted how a range of potential drivers feed into wellbeing, based on the NEF (2008a, 2011) dynamic model of wellbeing, including external conditions, personal resources, policy levers and the 'Five ways to well-being' (see Figure 4). The 'Five ways to wellbeing' (NEF, 2008b³⁴) are drivers of wellbeing that are easily controlled by an individual, and hence which an individual can take charge of in attempting to improve their own wellbeing (see Box 2).

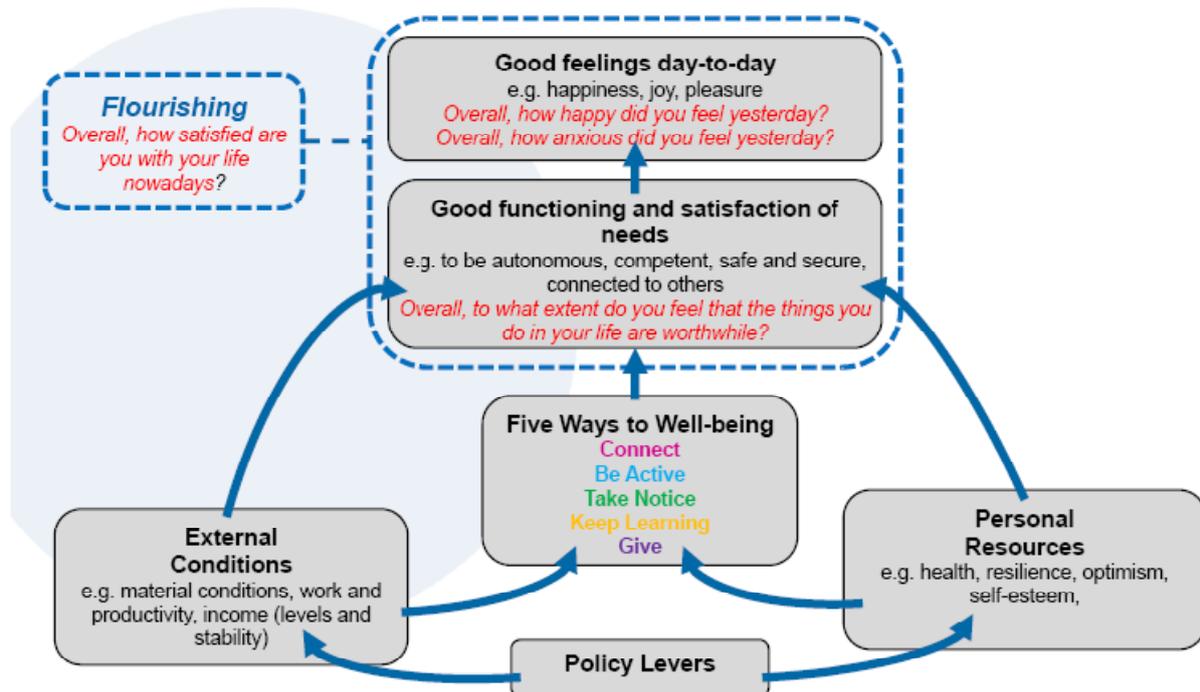
³² HM Treasury (2011). See 3

³³ Seaford (2011). Well-being evidence and policy: making some links. Presentation to University of Cambridge Well-being Institute and the Centre for Science and Policy (CSaP) panel discussion on Measuring National Well-being, Church House Conference Centre, London, 29th September

³⁴ NEF (2008b). Five ways to wellbeing: the evidence. NEF, London.

<http://www.neweconomics.org/publications/five-ways-well-being-evidence>

Figure 4 Policy influences the *drivers* of well-being



Source: Seaford (2011)

Some of the drivers that NEF have identified from the literature which policy makers may usefully consider at both appraisal and evaluation stages are:

Demographics, economic circumstances, household type, housing status, health, education, accommodation, family structure, ethnicity, benefit entitlements, time to do enjoyable activities, relationships, lifestyle/events, money worries, neighbourhood, work status, qualifications, relocation, commuting, sick leave, hours worked, type of work, education, credit card use, utility bills, household goods, holidays and mortgages (Seaford, 2011)

It is also of vital importance that these drivers do not affect everyone in the same way. Patterns of wellbeing, and relevant drivers may vary across different population groups and geographical areas. Some questions that NEF suggest policy makers consider here are:

- Is there inequality of well-being between localities and within localities?
- What factors characterise areas with low reported well-being or unequal well-being?

- Who are the people who are able to flourish in objectively deprived areas, and what are the area characteristics that help them?
- What is the impact of income or socio-economic inequality in different geographic locations?

This analysis suggests that distributional concerns should also play a central role in the assessment of wellbeing and social impacts. The Green Book guidance also highlights the importance of distributional analysis. The Green Book takes a cost-benefit approach and suggests that, at a bare minimum, policy appraisal should include a consideration of how costs and benefits accrue to different groups in society. These groups may be defined in terms of income, gender, ethnic group, age, geographical location or disability, taking into account issues of fairness and equality (especially with regards to existing discrimination legislation). The Green Book also highlights the issue of relative prosperity when it comes to income, taking on board the understanding that the same financial impact will be felt more strongly by those on lower incomes than by those on higher incomes. From the perspective of this paper, policy analysis that takes a wider view of how policy may differentially affect different groups within society is to be welcomed, especially where differential impacts may not necessarily group along traditional income lines, as appears to be the case with wellbeing.

Drivers of wellbeing are a useful way of including aspects of wellbeing that may not always have direct links to Government policy. Policy levers can influence the drivers of wellbeing rather than wellbeing directly. For example, in NEF's (2008a, 2011) dynamic model of wellbeing, policy can influence external conditions, personal resources and the drivers of wellbeing under people's individual control (the 'Five ways to well-being').

Box 2 Five ways to wellbeing

Connect...

With the people around you. With family, friends, colleagues and neighbours. At home, work, school or in your local community. Think of these as the cornerstones of your life and invest time in developing them. Building these connections will support and enrich you every day.

Be active...

Go for a walk or run. Step outside. Cycle. Play a game. Garden. Dance. Exercising makes you feel good. Most importantly, discover a physical activity you enjoy and that suits your level of mobility and fitness.

Take notice...

Be curious. Catch sight of the beautiful. Remark on the unusual. Notice the changing seasons. Savour the moment, whether you are walking to work, eating lunch or talking to friends. Be aware of the world around you and what you are feeling. Reflecting on your experiences will help you appreciate what matters to you.

Keep learning...

Try something new. Rediscover an old interest. Sign up for that course. Take on a different responsibility at work. Fix a bike. Learn to play an instrument or how to cook your favourite food. Set a challenge you will enjoy achieving. Learning new things will make you more confident as well as being fun.

Give...

Do something nice for a friend, or a stranger. Thank someone. Smile. Volunteer your time. Join a community group. Look out, as well as in. Seeing yourself, and your happiness, linked to the wider community can be incredibly rewarding and creates connections with the people around you.

Source: NEF (2008b)

2.5 Social impacts frameworks

The Government Economic Service review of the economics of sustainable development recommended that the assessment of social impacts of policy should be more systematic and consistent across government (GES, 2010³⁵). The review cites the International Association for Impact Assessment's (2003³⁶) principles for social impact assessment, which conceptualises social impacts as changes to one or more of the following:

- People's ways of life - that is, how they live, work, play and interact with one another on a day-to-day basis
- Their culture - that is, their shared beliefs, customs, values and language or dialect
- Their community - its cohesion, stability, character, services and facilities
- Their political systems - the extent to which people are able to participate in decisions that affect their lives, the level of democratisation that is taking place, and the resources provided for this purpose
- Their environment - the quality of the air and water people use; the availability and quality of the food they eat; the level of hazard or risk, dust and noise they are exposed to; the adequacy of sanitation, their physical safety, and their access to and control over resources
- Their health and wellbeing - health is a state of complete physical, mental, social and spiritual wellbeing and not merely the absence of disease or infirmity
- Their personal and property rights - particularly whether people are economically affected, or experience personal disadvantage which may include a violation of their civil liberties
- Their fears and aspirations - their perceptions about their safety, their fears about the future of their community, and their aspirations for their future and the future of their children

³⁵ GES (2010). GES review of the economics of sustainable development. Defra, London. <http://archive.defra.gov.uk/evidence/economics/susdev/documents/esd-review-report.pdf>

³⁶ IAIA (2003). International Principles for Social Impact Assessment. Special Publication Series No 2. IAIA, Fargo, ND. <http://www.iaia.org/publicdocuments/special-publications/SP2.pdf>

Just as ONS has identified that fairness is important in wellbeing assessment, the GES review emphasises that in addition to overall assessment of social impacts, awareness of the differential distribution of impacts among different groups in society, and particularly the impact burden experienced by vulnerable groups in the community, is of prime concern (Vanclay, 2003, cited in GES, 2010).

The Social Impacts Taskforce paper by Gemma Harper and Richard Price (Harper and Price, 2011³⁷) states that including analysis of social impacts enables us to consider the widest possible range of impacts that policies can have on individuals, communities and society. The definition of social impacts used in the paper is shown in Box 3.

Box 3 Social impacts

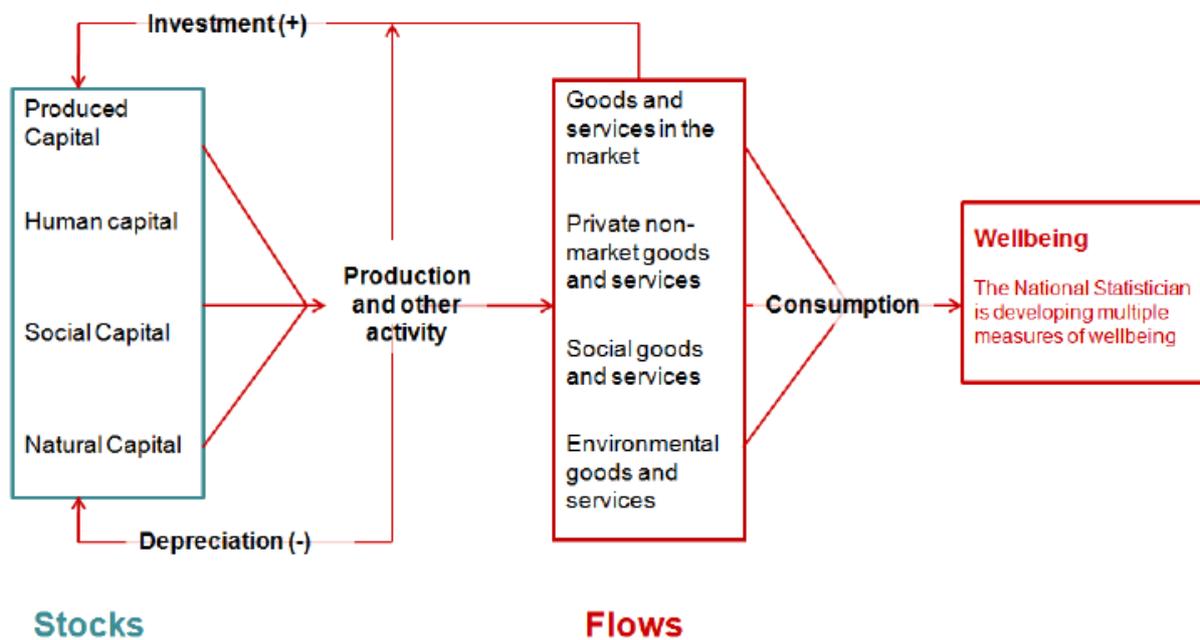
Social impacts of government policies are impacts on society, which encompass marketed and non-marketed goods and services and are essential for capturing the true costs and benefits of policies.

Source: Harper and Price (2011; 5)

Figure 5 sets out the conceptual framework developed by the Taskforce as the basis for understanding the relationships between the different components of capital, the production of flows of goods and services using the stock of capital; the consumption or experience of those goods and services by society, and their combined impact on wellbeing.

³⁷ Harper and Price (2011). A framework for understanding the social impacts of policy and their effects on wellbeing. A paper for the Social Impacts Taskforce. Defra Evidence and Analysis Series Paper 3. Defra, London. <http://archive.defra.gov.uk/evidence/series/documents/paper3-social-impacts-wellbeing-110403.pdf>

Figure 5 Stocks and flows framework for capitals, goods and services, and wellbeing



Source: Harper and Price (2011; 6)

The relationship between social impacts and wellbeing set out in this framework is that wellbeing results from the experience or consumption of goods and services, which may be market, private, social or environmental goods or services. Wellbeing is a function both of (1) whether those goods or services can be experienced (i.e., access to goods or services) and (2) the subjective experience thereof. For example, the wellbeing derived from a social support network will be a function both of the degree of access to such a network, and the subjective experience of that network (e.g., in terms of quality etc.).

The framework recognises that not all of the social impacts of a policy may be readily monetised, and that assessing social impacts may rely on qualitative as well as quantitative data. However, the paper suggests that including a full consideration of the social impacts of policy, both monetised and non-monetised, in appraisal will lead to a broader understanding of the potential outcomes of policies and aid in the prediction of their effects on wellbeing.

In addition to general guidance, detailed guidance has also been developed in some specific policy areas. For example, DfT has produced guidance on social and distributional impacts that need to be assessed as part of transport appraisal (DfT, 2011³⁸).

³⁸ DfT (2011). Detailed guidance on social and distributional impacts of transport interventions. TAG Unit 3.17. DfT, London. <http://www.dft.gov.uk/webtag/documents/expert/unit3.17.php>

3. Techniques for integrating non-monetary evidence

This section proposes a framework for integrating non-monetary evidence in social impacts and wellbeing valuation and appraisal. The approach has the following key elements:

- A multi-criteria analysis framework
- Identification of key social impacts and wellbeing domains and indicators relevant in the specific policy context, including those beyond the immediate policy area
- More systematic and integrated use of quantitative and qualitative evidence
- Enhanced stakeholder participation and deliberation
- Proportional approach, including light touch techniques

The section provides an overview of multi-criteria analysis, taking CLG's *Multi-criteria analysis: a manual* (CLG, 2009³⁹) as its starting point, and proposes a five-step multi-criteria approach suitable for social impacts and wellbeing valuation and appraisal. The approach has two particularly important features. First, the five steps include paying particular attention to identifying and assessing quantitative and qualitative evidence. Second, enhanced stakeholder participation and deliberation is considered important and can be included at any stage, or throughout the process.

The section discusses selected other tools to aid social impacts and wellbeing valuation and appraisal. In particular, logic models can help detail exactly how a policy is intended to achieve its objectives, and thereby identify the extent to which a range of policy options are likely to achieve their intended social impacts and wellbeing benefits. Distributional analysis and segmentation can help to identify the impacts of policy options for different social groups, defined by a range of demographic, attitudinal, behavioural and other characteristics and not just in relation to income.

Drawing on recent reviews by Fish *et al.* (2011a)⁴⁰ and Stagl (2007)⁴¹, the section provides an overview of a range of specific MCA techniques which enable

³⁹ CLG (2009). See 14

⁴⁰ Fish *et al.* (2011a). See 8

monetary and non-monetary expressions of value to be integrated, which all incorporate different forms of stakeholder engagement and deliberation, and which offer potential in social impacts and wellbeing valuation and appraisal.

3.1 Introduction to multi-criteria analysis

CLG's *Multi-criteria analysis: a manual* (CLG, 2009) was originally commissioned by the Department for Environment, Transport and the Regions in 2000 and published as 'DTLR multi-criteria analysis manual'. It remains the principal central government guidance on the application of multi-criteria analysis (MCA) techniques.

MCA techniques are fairly wide ranging, although the basic method involves a structured approach to differentiating between a range of options, based on a set of objectives or criteria, against which each option is assessed. MCA techniques can be used to address a wide range of problems, and at different stages of the policy process. For example, MCA is often used to screen a range of options at an early stage of analysis before more detailed assessment, but it can also be used as a detailed appraisal technique. In contrast, cost benefit analysis comprises a more similar set of approaches (CLG, 2009).

The manual indicates that MCA can be used to complement cost-benefit analysis in circumstances where monetary valuation is possible. Although stated preference and revealed preference techniques are suitable for monetary valuation of some non-market impacts, they are not practical in all circumstances, for a range of reasons. For example, in some situations it may be too expensive to collect relevant data, or it may be too problematic to present the issue and relevant evidence in a way that enables people to make trade-offs with money in a robust way (CLG, 2009). The manual states that CBA is sometimes criticised on political or philosophical grounds, but in practice does not consider these issues to be a major obstacle.

Most policy appraisals identify impacts which are considered relevant, but which are not valued in monetary terms (CLG, 2009). The lack of monetary values for these impacts may not make any difference to the appraisal recommendations,

⁴¹ Stagl (2007). See 15

since these impacts may be small relative to the monetised impacts, or they may reinforce the recommended options identified through the monetary valuation. However, where there is little difference between options following monetary valuation, even relatively small non-monetised impacts may make a difference.

The manual states that in some circumstances there may be impacts where satisfactory monetary valuations have not been determined as part of appraisal but which are nevertheless considered to be highly significant. In these situations, the manual indicates that MCA techniques may be particularly helpful.

MCA typically involves construction of a performance matrix, with each row representing a policy option. Each column is used to assess the performance of policy options against each of the objectives or criteria. Assessment of the policy options can be made using numerical scores, high/medium/low type assessments, or colour coding as appropriate.

The manual states that one of the central characteristics of MCA is the importance it places on the judgement of decision-makers. This judgement is important at all stages of the process, including determining appropriate decision-making criteria, identifying appropriate weights, and in scoring options against each objective. Objective evidence can be included in the analysis, but decision-makers' own selection of criteria, weighting and performance scores is considered part of MCA's foundation. The manual acknowledges that the subjective nature of this process including scoring can cause concern. However, it states that MCA 'can bring a degree of structure, analysis and openness to classes of decision that lie beyond the practical reach of CBA' (CLG, 2009; 20).

The manual recommends either:

- An approach based on establishing a performance framework, and selection of the preferred option with limited subsequent analysis; or
- Use of what is termed a multi-criteria decision analysis (MCDA) approach

MCDA is a decision-making technique intended to help put a set of options in order of preference, and is specifically intended for issues and decision-making contexts where there are multiple criteria, where some may be monetary but

others are expressed in non-monetary form (CLG, 2009). MCDA allows the different elements of the problem to be assessed separately but, crucially, also provides a holistic picture of the performance of all options across all criteria to enable a well informed decision to be made. The MCA manual indicates that MCDA is now widely used throughout the United States, at all levels of government.

The manual sets out an eight step process for both MCA and MCDA, similar to the five step approach set out in this paper. However, the eight steps set out in the MCA manual notably include option development, which although crucial is considered outside the core scope of this paper.

Techniques for incorporating data and evidence in MCA are not addressed comprehensively in the manual. As noted above, the importance placed on the judgement of decision-makers is seen as one of the key features of MCA, although more systematic use of evidence is consistent with the approach.

Similarly, the manual highlights the importance of stakeholder involvement in MCA, but does not provide much detail on how this should be achieved. The manual highlights the question of whose priorities are to be included within the analysis. However, it states that it 'can go no further than identifying the issue of whose objectives should be represented as an issue which the analyst should recognise and address explicitly rather than implicitly' (CLG, 2009; 12).

3.2 Five step approach for integrating non-monetary social impacts and wellbeing evidence in valuation and appraisal

This section sets out a five step approach for integrating non-monetary evidence on social impacts and wellbeing in valuation and appraisal.

The five step approach has the following key characteristics:

- **A multi-criteria analysis framework**, involving structured identification and assessment of the ways in which policy options are intended to, and are likely to, achieve specific social impacts and what the consequences of policies may be for wellbeing. Some of the relevant impacts may be assessed as part of existing valuation and appraisal processes, but some may not be

fully taken into account at present. The MCA framework allows integration of monetary, quantitative and qualitative data.

- **More systematic and integrated use of quantitative and qualitative evidence.** This is important in a social impacts and wellbeing context, with increasing volumes of quantitative subjective wellbeing data becoming available. Qualitative evidence is also particularly important in understanding the detailed social impacts of particular policies, and their implications for wellbeing, for different groups of people and in different places.
- **Enhanced stakeholder participation and deliberation.** Stakeholder engagement can help to bring a wider range of views to appraisal, and help ensure objectives and criteria are included that may be left out by a narrowly defined appraisal group. Social impacts and the consequences of policies for wellbeing are complex and cut across policy areas. Deliberation can help participants improve their understanding of the issues and evidence before assessing the performance of different options. In both cases, stakeholder participation and deliberation can therefore help produce a more complete and accurate valuation. In addition, there is growing acknowledgement that there are dimensions of collective social impacts and societal wellbeing that are not adequately reflected in the sum of individual impacts. As a result, collective and shared values need to be assessed. Methods that involve participation and deliberation are more likely to enable shared values to be identified, articulated and assessed. Stakeholder participation and deliberation is also important because civic engagement, political voice, trust in institutions and governance are in themselves important constituents of wellbeing.

This approach is flexible and scalable. The full MCA process, including extensive use of external evidence and enhanced stakeholder participation and deliberation, will not be appropriate in every context. In certain circumstances, it is likely to be appropriate and proportionate for the framework to be applied as a light touch exercise with a relatively small group of decision-makers and analysts. In other circumstances, this can be combined with more systematic and integrated use of quantitative and qualitative evidence. For high risk or high profile, long term or large, complex policy issues, the full MCA approach set out here with rigorous and systematic use of evidence and enhanced stakeholder participation and deliberation may be appropriate.

The following five steps, together with stakeholder participation and deliberation, are illustrated in Figure 6:

- Step 1 Determine critical success factors
- Step 2 Weight critical success factors
- Step 3 Identify and assess the evidence for each policy option for each critical success factor
- Step 4 Score each policy option for each critical success factor
- Step 5 Analyse all policy options and critical success factors and decide on the preferred option

Steps 2 and 4, where weighting and scoring are undertaken, are optional. This allows for two basic approaches within the same framework - either a full multi-criteria analysis with weighting and scoring, or a multi-criteria approach without weighting and scoring. The latter approach still involves explicit identification of relevant social impact and wellbeing criteria, and the structured analysis of quantitative and qualitative evidence for each policy option against each criterion.

The five steps are described in more detail below. Stakeholder participation and deliberation, which can be incorporated throughout, is considered further in Section 3.4.

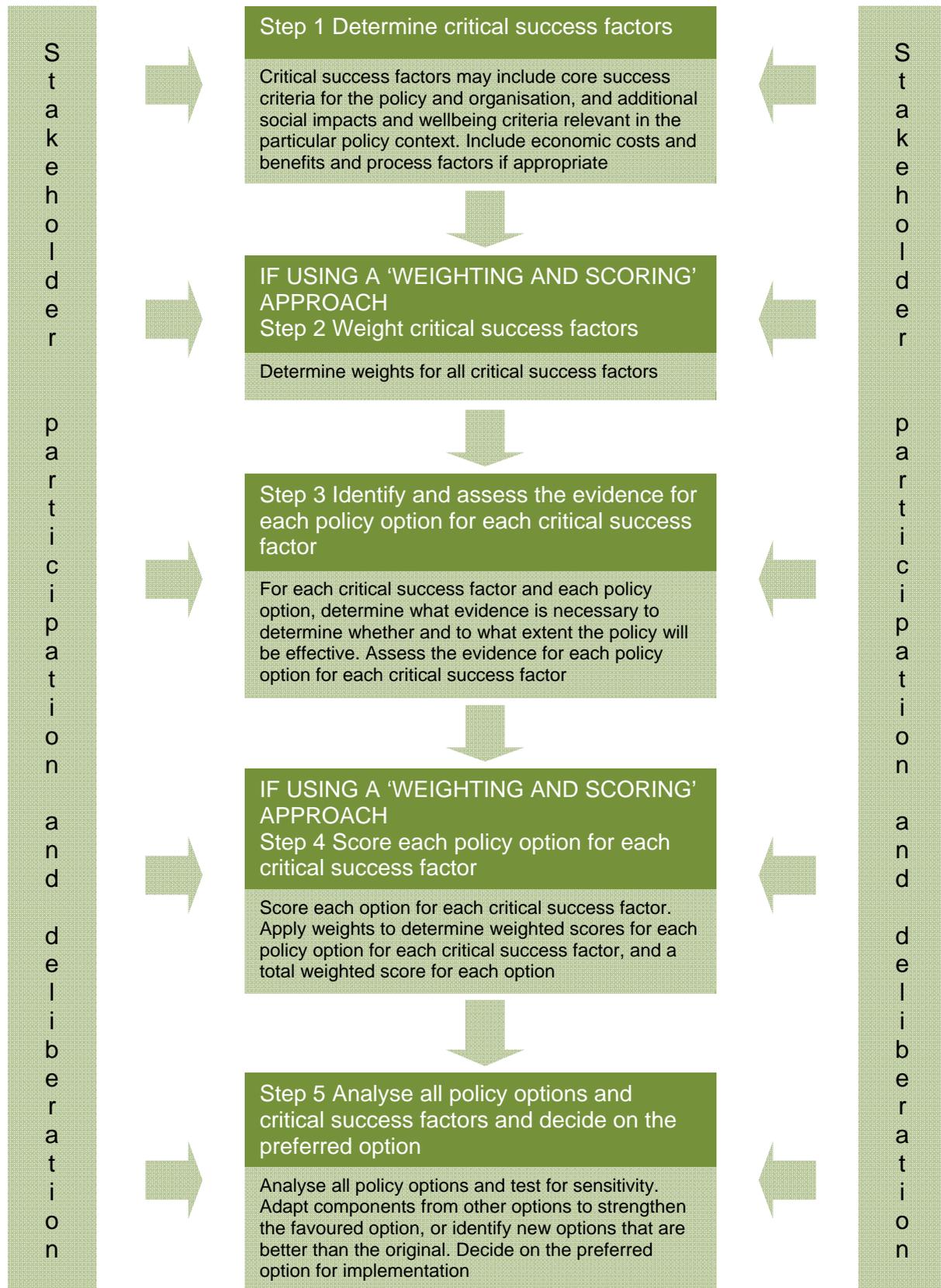
Step 1 Determine critical success factors

Critical success factors may include core success criteria for the policy and organisation, and additional social impacts and wellbeing criteria relevant in the particular policy context. Include economic costs and benefits and process factors if appropriate.

Core success criteria for the policy may include economic, environmental and social factors.

In order to integrate monetary and non-monetary evidence, criteria where costs and benefits can be valued in monetary terms should be included within the wider MCA.

Figure 6 Social impacts and wellbeing - five step approach for integrating non-monetary evidence in valuation and appraisal



Identification of additional social impacts and wellbeing criteria may be able to draw on the frameworks of wellbeing and indicator sets discussed in Section 2. However, further work is likely to be required to identify the specific relevant criteria in any particular policy and intervention context.

The MCA manual states that in general criteria should be selected to reflect the interests and views of the population as a whole. It is also important that the criteria chosen should allow those scoring options to express their preferences and not be excessively constrained by narrow criteria selection (CLG, 2009). If it becomes apparent that criteria don't allow this, then it may be possible to modify criteria during the weighting and scoring process, but this can be difficult in complex multi-stakeholder processes, as comparability between groups may be compromised. For this reason, an iterative or pilot process should be used within Step 1 to ensure a robust set of criteria before proceeding. Many MCA processes employ headline criteria and groups of sub-criteria.

The core values of the decision-making organisation may also be a useful way to identify relevant social impacts and wellbeing criteria. For example, the MCA manual cites a study of 18 'visionary' and 18 'merely excellent' companies by Collins and Porras (CLG, 2009; 57). The 18 visionary companies had core values which included 'being pioneers' for an aircraft manufacturer, 'improving quality of life through technology and innovation' for an electronics manufacturer, 'preserving and improving human life' for a medical company, and 'bringing happiness to millions' for an entertainment corporation. Collins and Porras identified many situations in which reduced profits were accepted in order to uphold these values, which is analogous to basing appraisal decisions on important non-monetary as well as monetary criteria.

The choice and definition of criteria can be very influential in deciding which options rank highly, or which changes may be needed to the original options, as the criteria chosen reflect the 'framing' of the problem. The MCA manual states that time spent determining the criteria may be 'the most important time of all, and generally much more so than excessive fine-tuning of the numerical detail of the models themselves' (CLG, 2009; 144).

IF USING A 'WEIGHTING AND SCORING' APPROACH, CONTINUE TO STEP 2, OTHERWISE GO STRAIGHT TO STEP 3

Step 2 Weight critical success factors

Determine weights for all critical success factors.

The MCA manual states that 'swing weighting' is now recommended by most MCDA practitioners. This means that participants take into account the difference between the most favoured and least favoured options on each criterion, as well as the extent to which that difference matters.

In other words, there is an important difference between the objective score for a particular option and the importance that may be assigned to that performance by different groups of decision-makers in different contexts. Differences in performance may well be real in objective terms but of little significance in the specific decision-making context. Conversely, small changes in objective performance may be decisive, perhaps if an important threshold is crossed.

The manual indicates that the swing weighting method can be accomplished with a group of key players using a 'nominal group technique', and explains how this might be done. The guidance states that this group will usually comprise representatives of the decision-making organisation, or those senior participants 'whose perspectives on the issues enable them to take a broad view, which means they can appreciate the potential tradeoffs among the criteria' (CLG, 2009; 64).

The process of deriving weights is fundamental to the effectiveness of an MCDA. The manual states that the way in which weights are determined highlights the question of whose views are considered most significant but does not explicitly consider techniques for involving a wider range of participants in determining weights.

Enhanced stakeholder participation and deliberation at this stage can help understand how much the performance of different options on social impact

and wellbeing criteria matters to a wider range of stakeholders including those most likely to be affected.

Step 3 Identify and assess the evidence for each policy option for each critical success factor

For each critical success factor and each policy option, determine what evidence is necessary to determine whether and to what extent the policy will be effective. Assess the evidence for each policy option for each critical success factor.

The MCA manual does not explicitly consider the use of evidence in detail. Indeed, MCA is sometimes seen as subjective, because of the importance it places on the judgement of decision-makers in determining appropriate criteria, weights and performance scores. However, MCA processes can incorporate more systematic use of documented evidence.

This paper argues for more systematic use of quantitative and qualitative evidence within an MCA framework, principally because appraisal should be based on robust evidence where possible.

Increasing volumes of quantitative social impacts and wellbeing data are becoming available through ONS, other surveys and evaluation, and these datasets collectively provide a valuable resource to enable social impacts and wellbeing to be assessed much more comprehensively than in the past.

A recent National Audit Office report identified unstructured use of qualitative evidence as one of the main weaknesses in option appraisal (NAO, 2011⁴²). Qualitative evidence is likely to be particularly important in social impacts and wellbeing appraisal to help understand the detailed impacts of particular policies for different groups of people and in different places.

Overall, the following types of evidence will need to be considered:

- Evidence relating to the core success criteria for the policy

⁴² NAO (2011). Option appraisal: making informed decisions in government. NAO, London.
http://www.nao.org.uk/publications/1012/option_appraisal.aspx

- Evidence relating to the additional social impacts and wellbeing criteria relevant in the particular policy context
- Evidence relating to the steps in the logic model indicating whether the policy will be successful in achieving its stated objectives. In other words, what evidence is needed to assess the robustness and assumptions underpinning the steps in the model?
- Evidence relating to distributional impacts

A general principle at this step should be to make good use of existing evidence but also collect new evidence where necessary.

ONS's Wellbeing Knowledge Bank⁴³ provides a repository of information and links to help identify relevant evidence.

More systematic and integrated use of quantitative and qualitative evidence is considered further in Section 3.3.

IF USING A 'WEIGHTING AND SCORING' APPROACH, CONTINUE TO STEP 4, OTHERWISE GO STRAIGHT TO STEP 5

Step 4 Score each policy option for each critical success factor

Score each option for each critical success factor. Apply weights to determine weighted scores for each policy option for each critical success factor, and a total weighted score for each option.

The MCA manual provides a detailed discussion of different approaches to scoring. One common option is to assign a numerical score between 0 and 100 for each policy option for each critical success factor.

The manual outlines two basic approaches to scoring between 0 and 100. 'Global scaling' involves assigning a score of 0 to the worst performance envisaged in the decision-making context being considered, and a score of 100 to the best performance. In contrast, 'local scaling' involves assigning 0 to the worst of the policy options being considered and 100 to the best (CLG, 2009; 42).

⁴³ <http://www.ons.gov.uk/ons/guide-method/well-being/wellbeing-knowledge-bank/index.html>

Once the boundaries of 0 and 100 have been determined, the manual describes three approaches to scoring each of the options:

- A **value function** can be used to calculate a score between 0 and 100 from an objective measurement. Many value functions assume a linear relationship between objective measurement and performance scores, but non-linear relationships may also be appropriate
- A **direct rating** can be determined by asking decision-makers to use their expert judgement to score each option between 0 and 100
- Scoring can also be approached **indirectly**, for example by asking decision-makers to consider the relative performance of pairs of options, gradually building up a picture of appropriate scores for all options

The manual highlights that final performance scores for each option across all criteria can be calculated using a simple weighted averaging approach only if all the criteria are 'mutually preference independent' (CLG, 2009; 65). This means that the scores for each criterion should not be affected by scores for any other criterion. Scores can be mutually preference independent yet still be statistically correlated. If dependence exists, the manual indicates that it may be possible to combine the criteria in such a way as to incorporate both meanings. If not, MCDA can accommodate the criteria, but the mathematics becomes slightly more complicated.

Step 5 Analyse all policy options and critical success factors and decide on the preferred option

Analyse all policy options and test for sensitivity. Adapt components from other options to strengthen the favoured option, or identify new options that are better than the original. Decide on the preferred option for implementation.

The MCA manual states that MCA processes sometimes lead to unexpected results which should be examined and understood before final decisions are made.

Sensitivity analysis provides a means for testing how much any difference to the inputs (perhaps reflecting different views) makes to the final overall results. For example, sensitivity testing may examine what difference any choice of weights

has made. Stakeholders are likely to have different views of the most important criteria and score options differently, but can be surprised that these differences may not affect the final recommendations. Consequently, the MCA manual highlights that sensitivity analysis can help resolve disagreements between interest groups.

Linked to this, it follows that it may not always be worth fine tuning scores and weights, but participants may find this difficult to accept until they understand why changes sometimes make relatively little difference. The manual states that the reason for this insensitivity is that 'the scores on many of the criteria will show high statistical correlation, and thus the weights on those criteria can be distributed amongst the correlated criteria in any way' (CLG, 2009; 70).

It is also important at this stage to borrow components from other options to strengthen the preferred option or identify new options that are better than the original ones proposed. However, the strengthening of options or generation of new options does not have to be left to Step 5 and can be undertaken at any point.

Computer packages exist to aid the entire MCA process, and they may certainly help in analysis at this stage if software has been employed. However, the MCA manual emphasises that most important elements of the approach do not depend on sophisticated computer packages.

3.3 Systematic and integrated use of quantitative and qualitative evidence

Making use of existing quantitative and qualitative evidence and collecting new data where necessary

As discussed in Section 3.3, social impacts and wellbeing appraisal should make good use of existing quantitative and qualitative evidence, and undertake new data collection and analysis where necessary.

In particular, there will be increasing volumes of wellbeing data from ONS and other large scale quantitative surveys which will, especially over time, improve understanding of the likely impacts of policy options on individual and collective wellbeing. Social impacts and wellbeing data from large scale quantitative surveys will be available from the UK Data Archive⁴⁴.

In relation to qualitative evidence, the NAO report, *Option appraisal: making informed decisions in government*⁴⁵, states that unstructured qualitative analysis is one of the main weaknesses in current appraisal. The report states while qualitative arguments were influential in a large proportion of cases examined, few followed guidance on ways to structure that analysis, or applied a qualitative structure consistently to all options considered.

Significantly, the survey of staff involved in appraisal carried out for the study found that most staff believed non-monetised costs and benefits are currently adequately analysed. Seventy-five percent of those surveyed agreed or strongly agreed with the statement 'Qualitative costs and benefits that cannot be monetised are, in general, adequately discussed', while only 18 percent disagreed or strongly disagreed. The NAO report notes that if this analysis does occur it was not readily identifiable in the appraisal documents reviewed (NAO, 2011; 18).

This weakness is considered particularly relevant to social impacts and wellbeing valuation and appraisal since qualitative evidence is often likely to be important

⁴⁴ <http://www.data-archive.ac.uk>

⁴⁵ NAO (2011). See 42

in understanding the social and other impacts of policy interventions and their effects on wellbeing in specific contexts, for specific groups of people and in particular places.

The Magenta Book (HMT, 2011⁴⁶) provides guidance on reviewing existing evidence. In particular, Chapter 6 has sections on 'Reviewing the existing evidence' and 'Systematic review'. Social research textbooks also contain general material on techniques for assessing existing evidence. For example, Bryman (2008)⁴⁷ includes chapters on reviewing the literature, quantitative data analysis, documents as sources of data, and qualitative data analysis. Spencer *et al.* (2003)⁴⁸ provide a framework for assessing the quality of qualitative evidence.

Rapid Evidence Assessment (REA) is a structured approach for carrying out a light touch evidence review. The GSR Rapid Evidence Assessment Toolkit⁴⁹ is a web-based resource to aid carrying out or commissioning an REA. The Toolkit includes a range of guidance on the different stages of an REA, including determining whether REA is the most appropriate approach, identifying the most appropriate type of REA review, identifying the resources that are likely to be required, and communicating results.

Despite the existing evidence base, there may be gaps in understanding of social impacts and wellbeing at the level of specific policy interventions. For example, these gaps may relate to the subjective or objective impacts for particular groups of people or in particular places, or relate to the causal links between impacts and specific policy options.

New evidence should be collected where necessary to fill these gaps and ensure robust appraisal, but this paper does not provide details on methods to fill different types of evidence gaps, as these are discussed at length elsewhere. In particular, Chapter 7 of the Magenta Book covers data collection.

⁴⁶ HM Treasury (2011). See 3

⁴⁷ Bryman (2008). Social research methods. Oxford University Press, Oxford

⁴⁸ Spencer L, Ritchie J, Lewis J and Dillon L (2003). Quality in qualitative evaluation: a framework for assessing research evidence. Government Chief Social Researcher's Office, London.

http://www.civilservice.gov.uk/wp-content/uploads/2011/09/a_quality_framework_tcm6-38740.pdf

⁴⁹ <http://www.civilservice.gov.uk/networks/gsr/resources-and-guidance/rapid-evidence-assessment>

Overall, social impacts and wellbeing evidence will need to be interdisciplinary, and draw from a wide range of social science disciplines including anthropology, geography, politics, psychology and sociology. New social impacts and wellbeing data collection should utilise a broad range of quantitative and qualitative research methods, including for example quantitative approaches such as structured interviews and self-completion questionnaires, but also qualitative methods including ethnography and participant observation and qualitative interviews (see Bryman, 2008).

A wider range of societal values associated with social impacts and wellbeing can also be understood and assessed through other published reports, documents and the media.

Logic models

Logic models can help identify the type of evidence needed to assess the social and other impacts associated with different policy options and the consequences for wellbeing. Social and other impacts often cut across policy areas, and include unintended consequences.

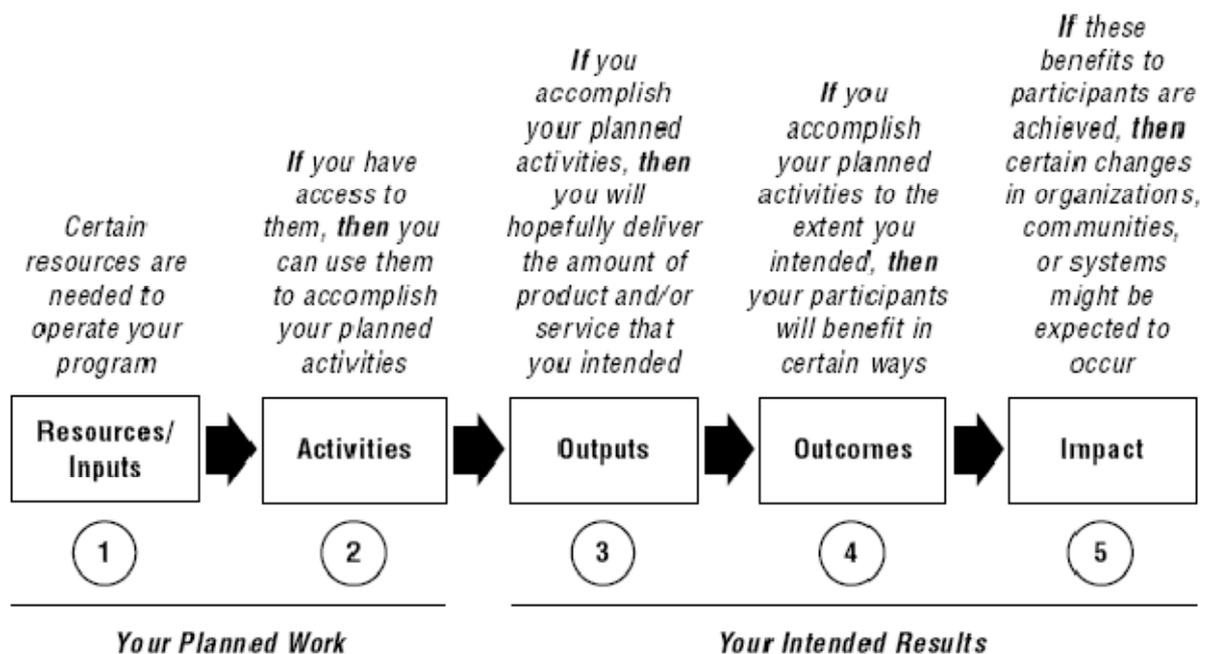
The Magenta Book states that a common method for setting out policy objectives and outcomes is to develop logic models (also known as 'intervention logic' or 'programme theory'). A logic model describes the theory and assumptions underlying the rationale for a policy. It links policy inputs, activities, processes and theoretical assumptions with the intended outcomes (both short and long-term) (see Figure 7).

Although logic models are not new, systematic use at the planning and design stage 'finds "gaps" in the theory or logic of a program', and 'builds a shared understanding of what the program is all about and how the parts work together' (Kellogg Foundation, 2004; 6⁵⁰).

⁵⁰ Kellogg Foundation (2004). Logic model development guide. Kellogg Foundation, Battle Creek. <http://www.wkkf.org/knowledge-center/resources/2006/02/WK-Kellogg-Foundation-Logic-Model-Development-Guide.aspx>

The Tavistock Institute has also produced a useful guide for logic mapping (Tavistock Institute, 2010⁵¹). Although this was commissioned by DfT and designed to aid transport evaluations, it has wider applicability as a tool to support the planning, design and appraisal of interventions.

Figure 7 Components of a logic model



Source: Kellogg Foundation (2004; 3)

Distributional analysis and segmentation

As discussed in Section 2, fairness is an important underlying theme in both social impacts and wellbeing analysis.

For example, equality and fairness are important part of the national wellbeing measures being developed by ONS (2011a⁵²; 2011b⁵³). The Stiglitz report also highlights the importance of distributional effects. It states that a system to measure wellbeing 'should not just measure average levels of wellbeing within

⁵¹ Tavistock Institute (2010). Logic mapping: hints and tips. DfT, London.

<http://www.dft.gov.uk/publications/logic-mapping-advice-guide>

⁵² ONS (2011a). See 9

⁵³ ONS (2011b). See 10

a given community, and how they change over time, but also document the diversity of peoples' experiences' (Stiglitz *et al.*, 2009; 12).

The MCA approach put forward in this paper provides a framework for considering the diversity of views of individuals and groups, and the values they assign to different costs and benefits. This contrasts with many analyses carried out in monetary terms which conceal differences between groups. The MCA manual, for example, states that 'Analysis which is carried out in monetary terms does not usually, in practice, present the analysts with problems of choosing between the interests of different groups in society (CLG, 2009; 12).

Segmentation is a key tool for helping to understand different social and other impacts and the effects on wellbeing for different groups in society, going beyond different income groups. The Cabinet Office *Guide to Segmentation* (Cabinet Office, 2009⁵⁴) states that at its simplest, segmentation is about classifying a population into different groups. The guide describes how to segment and how to use the results of segmentation. It gives a suggested approach that should be flexible enough to work across a range of needs, circumstances and budgets.

The guide identifies four broad ways in which to segment, based on who people are, what they do, how they think and feel, and by considering all these together (Table 2). The guide recommends using this tool at the planning stage, to help think about the different ways in which the total population can be divided. The ways to segment include income, but this is just one of many ways to think about differences in the population that may be affected by a policy and understand the potential social and other impacts of a policy and its consequences for wellbeing.

In addition to general guidance, there is a range of policy specific guidance on distributional analysis and segmentation that can be drawn on to inform social impacts and wellbeing appraisal in particular policy contexts, and which may also be of wider methodological interest. For example, DfT have published guidance on assessing the social and distributional impacts of transport

⁵⁴ Cabinet Office (2009). Guide to segmentation. Cabinet Office, London.

<http://interim.cabinetoffice.gov.uk/contact-council/contact-council-resources.aspx#guide-to-customer>

interventions (DfT, 2011⁵⁵), and Defra have produced a segmentation for pro-environmental behaviours (Defra, 2008⁵⁶).

The views of different individuals and groups and the values they assign to social and wellbeing costs and benefits is also addressed through enhanced stakeholder participation and deliberation, discussed in the next section.

⁵⁵ DfT (2011). See 38

⁵⁶ Defra (2008). A framework for pro-environmental behaviours. Defra, London.
<http://archive.defra.gov.uk/evidence/social/behaviour>

Table 2 Ways to segment

Dimension	Focus	What it is	Used for things like ...
Who people are	Demographic	Age, sex, income, family, social class	Targeting pension messages at those over a certain age
	Geographic	Where people live, housing type	Targeting Local Authority initiatives by ward
What people do	Value	How much people spend, or how much they cost to serve	Focusing customer service help on people who make most mistakes
	Behavioural	The way people live, what people do; e.g. how they use a service	Targeting policy interventions at people who drive most dangerously
	Occasion-based	Situation or occasion people are experiencing, e.g. when they use a service	Offering different anti-smoking measures according to when people smoke
How people think and feel	Attitudes/emotions	Loves and hates, attitudes, beliefs, motivations, strongly held views	Developing different policies for advocates and blockers
	Needs/experiences	What needs people experience when using a product or service	Distinguishing between high and low dependency patients
Multi-dimensional	Combination	Combination of who they are, what they do, how they think and feel	Identifying high risk groups like older smokers who don't think much about their health

Source: Cabinet Office (2009; 25)

3.4 Enhanced stakeholder participation and deliberation in valuation and appraisal

Rationale for enhanced stakeholder participation and deliberation

Stakeholder participation and deliberation can help improve social impacts and wellbeing appraisal for a range of reasons.

Stakeholder engagement can help to bring a wider range of views to appraisal, and help ensure objectives and criteria are included that may be left out by a narrowly defined appraisal group. Social impacts and wellbeing are often complex and cut across policy areas. Deliberation can help participants improve their understanding of the issues and evidence before assessing the performance of different options. In both cases, stakeholder participation and deliberation can therefore help produce a more complete and accurate valuation.

Social impacts and wellbeing have significant subjective components. One way to assess the impacts of particular policies on different individuals and groups is therefore to involve those affected directly in valuation and appraisal, particularly if there is little prior evidence about the detailed impacts of different policy options.

There is growing acknowledgement that there are dimensions of collective social impacts and societal wellbeing that are not adequately reflected in the sum of individual impacts, and as a result collective and shared values need to be assessed. Methods that involve participation and deliberation are more likely to enable shared values to be identified, articulated and assessed (see for example Fish *et al.*, 2011b⁵⁷).

Stakeholder participation and deliberation is important because civic engagement, political voice, trust in institutions and governance are in themselves important constituents of wellbeing (for example, Harper and Price, 2011; OECD, 2011; ONS, 2011b; Stiglitz *et al.*, 2009).

⁵⁷ Fish *et al.* (2011b). See 16

Stakeholder participation and deliberation also offers the potential for learning in the appraisal process, by providing an opportunity for policy and decision-makers, other stakeholders, specialists and citizens to come together to share views and information and assess the merits of different options. They may be appropriate at the consultation stage of the Impact Assessment process as well as the final stage. Owens *et al.* (2004)⁵⁸ suggest that an important role for appraisal may be in providing these kinds of spaces for dialogue and learning in policy and decision-making.

Green Book and MCA manual approaches to stakeholder engagement

The Green Book emphasises the importance of stakeholders, emphasising that appraisal should be carried out collaboratively wherever possible (HMT, 2003). In relation to multi-criteria analysis, the Green Book states that 'the weight to give to factors that are thought to be important by key players cannot be decided by "experts"', and should incorporate the judgments of stakeholders (HMT, 2003; 35). However, the Green Book gives little guidance on methods for involving stakeholders in appraisal.

In discussing procedures to derive criteria, the MCA manual states that interest group perspectives may be important and indicates that it may be appropriate to involve stakeholders directly in the MCA. However, the guidance appears to take a fairly narrow view of this possibility, suggesting it may be a suitable approach for some local planning issues. A further two indirect approaches are considered. First, it may be possible to examine policy statements and other documentation to gain insight into the views of people likely to be impacted by decisions, and to develop criteria accordingly. Second, the manual considers that it may be possible, if the decision-making team has appropriate skills, for one or more members 'to role play the position of key interest groups, to ensure that this perspective is not overlooked when criteria are being derived' (CLG, 2009; 33).

In relation to MCDA, the manual states that the people responsible for the design of the process need to decide who should be involved. Specifically, the manual considers the role of stakeholders and 'key players'. A key player is

⁵⁸ Owens S, Rayner T and Bina O (2004). New agendas for appraisal: reflections on theory, practice, and research. *Environment and Planning A* 36, 11, 1943-1959

considered to be 'anyone who can make a useful and significant contribution to the MCDA' (CLG, 2009; 51). Although in theory this could include a wide range of stakeholders, the manual implies narrower involvement. It explicitly considers that key players could include representatives of the decision-making organisation and outside experts who may not have a stake in the decision but have important knowledge to inform the process. The manual suggests that stakeholders may not actually participate in the analysis, but it is important that their views are represented by the key players.

The MCA manual states that one approach to stakeholder engagement is to use facilitated workshops, and indicates that these may include any mix of stakeholders and key players. The manual explicitly consider a range of workshop formats, including formats that allow issues to be discussed in depth over a significant period of time. For example, the manual states that workshops may last for a few hours for simple issues, but may last several days or be spread out over several months for more complex topics. In this way, the manual suggests that MCA workshops can be organised to help inform decisions over resources from tens of thousands to hundreds of millions of pounds.

The MCA manual makes no explicit reference to members of the public as stakeholders or key players, and does not discuss public participation.

It should be noted that MCA is not in itself a participatory technique and, as discussed above, is often used with a relatively small team of decision-makers and analysts with input from key stakeholders and experts. However, in the last ten years a number of new methods have been developed to integrate wider stakeholder participation and deliberation with MCA.

Wider engagement techniques

A broad range of engagement strategies may be employed in policy and decision-making. Burgess and Chilvers (2006)⁵⁹ identify a typology of engagement strategies for public and stakeholder involvement with the categories shown below. Annex 1 describes each of these engagement

⁵⁹ Burgess and Chilvers (2006). Upping the ante: a conceptual framework for designing and evaluating participatory technology assessments. *Science and Public Policy* 33, 10, 713-728

strategies and indicates a range of methods which are typically associated with each approach:

- Strategy 1. Education and information provision
- Strategy 2. Consultation (predominantly open to all)
- Strategy 3. Consultation (targeting the public/citizens)
- Strategy 4. Dialogue/deliberation (groups of predominantly local stakeholders)
- Strategy 5. Deliberation/dialogue (groups of predominantly professional stakeholders)
- Strategy 6. Deliberation/dialogue (groups of citizens and specialists)

Defra's recently published guide on *Participatory and deliberative techniques to support the monetary and non-monetary valuation of ecosystem services* (Fish *et al.*, 2011a⁶⁰) identifies three broad groups of techniques:

- **Survey techniques:** where values are elicited through the direct questioning of people. Structured questionnaires, semi-structured interviews and focus groups are example of survey techniques.
- **Deliberative techniques:** where values are elicited through a process of extended group discussion, debate and learning. In-depth discussion groups and citizen juries are examples of deliberative techniques.
- **Analytic-deliberative techniques:** where group based deliberation is integrated with technical approaches to policy appraisal. Deliberative monetary valuation and deliberative multi-criteria analysis are examples.

The guide emphasises that deliberative multi-criteria analysis can be used to appraise costs and benefits that may otherwise remain unvalued. Overall, the report states that participatory and deliberative techniques complement and extend desk based approaches where there are weaknesses in available evidence and understanding. Techniques in each of the three broad groupings above can be used to generate monetary values and non-monetary evidence within valuation and appraisal processes (see Table 3).

⁶⁰ Fish *et al.* (2011a). See 8

Table 3 Valuation and appraisal techniques by level of engagement

Type of value	Level of engagement			
	Desk-based analytic	Survey based	Deliberative	Analytic-deliberative
Monetary	Analysis of published evidence; value transfer	Stated preference techniques	Stated preference techniques with repeat focus groups	Deliberative monetary valuation
Non-monetary	Analysis of published evidence	Questionnaires; semi-structured interviews; focus groups	In-depth discussion groups	Deliberative multi-criteria analysis (although can include monetary)

Source: Adapted from Fish *et al.* (2011a)

A review undertaken for the Sustainable Development Research Network (SDRN) highlights a range of new valuation and appraisal techniques that have been developed in the last ten years which ‘combine interpersonal deliberation and quantitative methodologies to produce both depth and breadth in valuation and appraisal processes’ (Stagl, 2007; 9⁶¹).

The review assesses six valuation methods, which can all be considered analytic-deliberative approaches:

- Deliberative monetary valuation
- Social multicriteria evaluation
- Three-stage multicriteria analysis
- Multicriteria mapping
- Deliberative mapping
- Stakeholder decision / dialogue analysis

⁶¹ Stagl (2007). See 15

The review states that the six techniques vary slightly but together are very different from cost benefit analysis and other conventional monetary valuation techniques, in that they allow incommensurable values to be taken into account. In addition, hybrid methods such as these open up 'the appraisal of projects, plans, programmes, and technologies to other forms of framing and reasoning' (Davies, 2006, cited in Stagl, 2007; 9). The briefing accompanying the review states that the six valuation and appraisal methods all:

- 'Account for different types of knowledge (monetary and non-monetary; quantitative and qualitative)
- Consider seriously the issue of inter-generational equity
- Provide opportunities for learning during the appraisal process
- Ensure transparency at each step of the appraisal process
- Have a strong element of public and stakeholder engagement' (Stagl, 2007; Briefing p4)

The review considers the advantages and disadvantages of the six techniques, and their use in a range of different policy contexts (see Box 4). Case studies using some of these techniques are discussed in further detail in Annex 2.

Box 4 Summary of the strengths and weaknesses of six analytic-deliberative valuation and appraisal techniques

Deliberative monetary valuation

The use of formal deliberation concerning an environmental impact to express value in monetary terms for policy purposes, and more specifically as an input to cost-benefit-analysis (Spash, 2001).

Cost-benefit analysis was developed for the appraisal of infrastructure projects and involves the collection of data from either existing markets or by use of surveys. In contrast, deliberative monetary valuation involves the construction of preferences through deliberation.

It is most suitable for the appraisal of projects:

- Whose impacts are well understood,
- With relatively short-term impacts (unless no or very small discount rates are applied)
- Which do not affect complex ecosystem services such as biodiversity

Social multicriteria evaluation

The combined use of participatory techniques and multicriteria analysis to aid decision-making about a number of policy, programme or project options while taking conflicting interests and multiple criteria into account.

Social multicriteria evaluation was developed to address complex issues and to deal with uncertainty in the context of sustainable development. It highlights transparency and social learning during the appraisal process (Munda, 2004). Guidance for options is obtained from public and stakeholder engagement and expert consultations, impacts are modelled by experts from various disciplines and the importance of different aspects of sustainability is assessed by the public or stakeholders.

This method is most suitable for the appraisal of policies, programmes or projects:

- Whose impacts are not well understood yet and therefore benefit from multidisciplinary modelling of impacts

Three-stage multicriteria analysis

The combined use of participatory techniques and multicriteria analysis to aid decision-making about policy options.

Three-stage multicriteria analysis was developed for the social appraisal of technologies characterised by risk and uncertainty. The sequencing and choice of participants is based on Renn's and Webler's (1993; 1998) 'co-operative discourse' model.

In this model, stakeholders select the evaluation criteria, experts present information and measure impacts, and citizens explore values. Data are collected from a specially designed group Delphi exercise, citizen panels and stakeholder workshops.

This method is most suitable for the appraisal of policies, programmes or projects:

- Whose impacts are reasonably well understood by experts
- Which contain a significant technical element

Multicriteria mapping

An interview-based multicriteria analysis that focuses on eliciting and documenting detailed technical and evaluative judgements concerning the performance of alternative options.

Multicriteria mapping was developed to address complex issues and to deal with uncertainty in the context of sustainable development.

It consists of six main steps, during which data are collected in individual interviews with stakeholders, and individual specialists and stakeholders appraise the performance of options against their own sets of criteria.

The method highlights the systematic exploration of uncertainties and the sources of variability between diverse viewpoints (Stirling, 1997).

This method is most suitable for the appraisal of policies, programmes or projects:

- To which stakeholders have had some exposure
- Where views not only about data, but also about options and criteria, are controversial

Deliberative mapping

The combined use of participatory techniques and multicriteria analysis to aid decision-making about policy options.

Deliberative mapping was originally developed to address complex issues and to deal with uncertainty and contested values in the appraisal of controversial technologies.

It measures the specific performance of options against set criteria and highlights the need to explore the arguments participants used to justify their judgements.

Specialists and small groups of citizens follow the same assessment process (Davies *et al.*, 2003). Data are collected in personal interviews and various types of workshops.

This method is most suitable for the appraisal of policies, programmes or projects:

- Where views are controversial and where value judgements are particularly important

Stakeholder decision / dialogue analysis

The combined use of group deliberation techniques and (a qualitative form of) multicriteria analysis to aid decision-making about policy options.

Stakeholder decision analysis was developed to address complex issues, characterised by uncertainty. It highlights the framing of problem, scoping options, eliciting criteria and making judgements through facilitated deliberation (Burgess, 2000). Data are collected during stakeholder workshops.

This method is most suitable for the appraisal of policies, programmes or projects:

- Where it is important to work first on a common problem understanding
- For which a rough impact assessment is sufficient as input in the decision process

Source: Stagl (2007; Briefing pages 4-6)

4. Participatory and deliberative monetary valuation

The previous sections of this paper are concerned primarily with using non-monetary evidence in social impacts and wellbeing valuation and appraisal. However, some of the stakeholder engagement techniques discussed can also be used to derive monetary values, and this section discusses some of these approaches.

Deliberative monetary valuation (DMV) has been developed to improve the robustness of monetary values generated through contingent valuation studies and other stated preference techniques (e.g., Kenter *et al.*, 2011⁶²). Stated preference techniques using quantitative surveys and interviews give rise to a range of difficulties including identification of the appropriate target population and sample selection, and have a variety of practical strengths and weaknesses (Fish *et al.*, 2011a⁶³).

Some of the general parameters and principles of DMV techniques are shown in Box 5. Fish *et al.* state that DMV aims to integrate stated preference with deliberation, although the precise methods vary with context and the objectives of the study. Fish *et al.* (2011a; 10) emphasise that a 'fundamental distinction within DMV is whether the process is designed to elicit the same values as the conventional stated preference technique (i.e., individual WTP/A estimates), or those based on an aggregate social value for change (i.e., social WTP/A estimates)'.

⁶² Kenter *et al.* (2011). The importance of deliberation in valuing ecosystem services in developing countries - evidence from the Solomon Islands. *Global Environmental Change* 21, 2, 505-521

⁶³ Fish *et al.* (2011a). See 8

Box 5 Deliberative Monetary Valuation: key parameters and principles

- DMV is group based; usually comprising between 5 and 20 people
- Individuals are provided with information about the issues which they are asked to discuss and formally deliberate on in an open and fair environment
- Group settings may take the form of an in-depth group discussion or may include more elaborate techniques, such as the use of Citizens' Jury in which deliberation is based on exposure to information provided by 'expert witnesses'
- Through group discussion and exposure to information, individuals learn about the issue. Preference construction is therefore part of the process
- Through learning in a deliberative setting, individuals are encouraged to understand an issue in terms beyond their personal welfare, so that the resulting valuation, judgements and outcomes will reflect a more complete and socially equitable assessment

Source: After Turner *et al.* (2010, cited in Fish *et al.*, 2011a; 39)

Individual and social willingness to pay/accept approaches are illustrated further in Box 6. Table 4 summarises four approaches to DMV alongside survey based methods. The questionnaire based survey on the left side of the table where individuals are asked what they personally would be willing to pay or accept represents the standard stated preference technique.

Overall, Kenter *et al.* (2011) argue that 'participation and deliberation should be integrated into valuation of any complex good, both in developing and developed economies'. In a study undertaken as part of the UK National Ecosystem Assessment, Fish *et al.* (2011b)⁶⁴ state that in the context of ecosystem services and associated decision-making both individual and group-based values are valid. In particular, they find that 'hybrid valuation techniques, such as deliberative monetary valuation and participatory multi-criteria analysis, hold much promise for systematic and integrated treatment of utilitarian, ethical and aesthetic considerations' (Fish *et al.*, 2011b; 1184).

⁶⁴ Fish *et al.* (2011b). See 16

It would appear that such methods offer promise for wider social impacts and wellbeing analysis, not least because social impacts, wellbeing and environmental valuation are often complex, concerned with a wide range of economic, social and environmental factors, and are fundamentally concerned with long term sustainability as well as present day costs and benefits. However, further work is required to develop these techniques in a range of different policy contexts.

Box 6 Deliberative Monetary Valuation: individual and social willingness to pay/accept approaches

Individual willingness to pay/accept through group deliberation

As a review by Spash (2008) shows, most DMV studies are attempting to increase the validity of individuals' utility WTP/A measure by using, before assessment, a deliberative process to improve: knowledge of the 'good'; scientific uncertainties; as well as the range of issues likely to impact on successful implementation of the proposal. This approach to DMV has two dimensions. Either DMV involves individuals expressing a value for what they would personally pay/accept following a group discussion, or the group makes a collective judgment of what they believe individuals should pay/accept.

In both cases the deliberative element brings a social learning dimension to the process. Determining what individuals should pay/accept is based on some explicit or implicit negotiation of shared values. In instrumental terms, combining SP techniques with group interaction is understood to provide for a richer understanding of what is being asked of individuals and help overcome the difficulties that respondents can experience when trying to understand the elements of a hypothetical market presented to them in a survey format ...

As Dietz *et al.* (2009) conclude: '[E]ven minimal group discussion seems to prompt citizens to think in terms of public values - the appropriate kind of thinking for public policy decisions - rather than in terms of individual considerations, such as charitable contributions, that dominated when responding to a standard CVM survey'.

Social willingness to pay/accept through group deliberation

The two alternative options for DMV take a quite different perspective ... In these cases, the deliberative model involves individuals being asked to determine an 'aggregate social value of an environmental change' (Spash 2008). In other words, through facilitated deliberation, participants are able to debate the pros and cons of a suggested course of action, including its scientific, economic and policy justifications, to determine value for what they believe society should pay/accept. The distinction between the options lies in the way the social willingness to pay/accept values are formally delivered: DMV is designed either to elicit individual views regarding the aggregate social value of a proposed course of action, or the group stating an aggregate social WTP/A.

This approach to valuation remains only weakly exemplified in practice. A useful example is provided by Gregory and Wellman (2001) who developed a process of groups' stating social willingness to pay values as part of estuary management in the Tillamook Bay catchment, northwestern Oregon.

Source: Fish *et al.* (2011b; 1189)

Table 4 Survey-based and deliberative monetary valuation: key variations

Valuation objective	Individual benefit values: Individual willingness to pay/accept			Collective benefit values: Social willingness to pay/accept	
Engagement level	Survey	Group			
Techniques (examples)	Questionnaire (Optional quality check via one off focus group)	In-depth discussion group or workshop(s)	Citizens' Jury, in-depth discussion group or workshop(s)	In-depth discussion group or workshop(s)	Citizens' Jury, in-depth discussion group or workshop(s)
Value expression	Individuals express a value for what they - personally - would pay/accept	Individuals express a value for what they - personally - would pay/accept	Groups express a value for what they believe individuals should pay/accept	Individuals express a value for what they believe society should pay/accept	Group expresses a value for what they believe society should pay/accept

Source: Adapted from Fish *et al.* (2011a)⁶⁵

⁶⁵ Fish *et al.* (2011a). See 8

5. Key challenges and future research agendas

Using qualitative evidence in appraisal

The major barriers and concerns about using qualitative and other non-monetary evidence in appraisal are often related to the small samples used in collecting this data, and the fact that these samples (by virtue of their size and purposive approach) are not representative.

However, it is important to understand the strengths of qualitative evidence, and that the paper argues a mixed method approach is optimal. We do not propose that qualitative evidence and MCA techniques replace monetised and/or statistical evidence, rather it is suggested that monetary and non-monetary evidence can complement each other and enrich understanding of the complex interplay of factors that can affect the social impacts of policies and their consequences for wellbeing.

For more detail on how to assess the quality of existing qualitative research and ensure that any new research is robust, see *Quality in Qualitative Evaluation: A framework for assessing research evidence* (Spencer *et al.*, 2003⁶⁶).

Measuring concepts accurately

It is difficult to measure complex concepts, such as wellbeing and social impacts, directly, which is why we use composite indicators which are taken to infer changes in the overall concept. For example, Fujiwara and Campbell (2011)⁶⁷ discuss the issue of whether life satisfaction and/or preferences are good measures of utility. In the wellbeing debate the ONS has drawn on existing literature to develop 10 domains that contribute to a full understanding of wellbeing and under each of these developed key indicators which are measurable in the real world (see Section 2 of this paper; ONS, 2011b⁶⁸). Taken together, it is intended that measuring all of these indicators will give a picture of changes in the complex and (at least partially) abstract notion of wellbeing.

⁶⁶ Spencer *et al.* (2003). See 48

⁶⁷ Fujiwara and Campbell (2011). See 12

⁶⁸ ONS (2011b). See 10

The extended debate on what indicators can assess social impacts and wellbeing illustrates clearly the difficulty in pinning complex concepts down to quantitative and measurable indicators. The risk is that if the package of indicators does not accurately represent the concept it is intended to, then any social impacts and consequences of policy on wellbeing may not be reflected realistically, and any causal relationships identified will not be accurate. Survey data is at high risk of this because:

- It does not examine people in their usual environment. Data that are collected through observing people in their natural environment, for example ethnographic data, can accurately identify how various concepts are used in everyday life and so is able to capture meaning and the nuances of concepts. This entails that where indicators are developed and measured it is more certain that they are the appropriate ones
- Questions and scales are open to different interpretation by different people. Qualitative evidence usually involves a greater degree of discussion or description so that the interpretation and meanings that people have put on questions, contexts and words become clear

Failing to construct the correct understanding of concepts and indicators leads to risks that models will not tie closely with the real world and predictive power will be lost. For example, some of the members of the Stiglitz Commission suggest that one of the reasons the current economic crisis took many by surprise is that 'our measurement system failed us and/or market participants and government officials were not focusing on the right set of statistical indicators' (Stiglitz *et al.*, 2009; 8⁶⁹)

For this reason the best quantitative data builds on concepts and indicators developed through high quality qualitative work, thus improving levels of both validity and reliability in comparison to either method alone. The combination of both types of evidence can confirm whether relationships identified in qualitative phases hold in the populations of interest.

The methods provided in this paper provide a systematic way of taking into consideration all the existing evidence available.

⁶⁹ Stiglitz *et al.* (2009). See 11

Representativeness

If statistical data are representative, this means being reasonably certain (depending on certain parameters) that any trends seen in the sample will be replicated in the population of interest. Well construed statistical findings can be said to have high levels of reliability. However, it should be borne in mind that statistical data are often drawn from surveys and there are certain considerations that need to be taken into account to be able to claim that such data are representative and conclude that findings from the sample are likely to hold in the population of interest, including: sampling bias, including self-selection bias, social desirability bias, non-response bias, interviewer/question bias, and issues around memory and reported behaviour/experience.

Fujiwara and Campbell (2011)⁷⁰ discuss these issues with social research methods in relation to stated preference and contingent valuation methods. The most robust way of reducing bias is to use a mixed method approach. Various methods have their own weaknesses or strengths, and use of more than one method (method triangulation) can help to highlight where findings are influenced by the choice of method, rather than from real behaviours or preferences. Findings can therefore be considered more robust when confirmed by several methods. Similarly, this paper advocates the use of a variety of evidence to strengthen policy decisions.

Context and Causation

Where evidence is collected about how people act in their usual environment, or enables a more in-depth discourse, a great deal can be learnt about people's attitudes and underlying values, including non-use values. This can give context to numerical and statistical data or findings and help to draw causal inferences or rule out spurious relationships. Thus, qualitative evidence is likely to be the best way of answering the question about whether life satisfaction or preferences really are the best measures of a person's utility by exposing whether there are underlying values that are not captured by those concepts but which are still important to people.

⁷⁰ Fujiwara and Campbell (2011). See 12

Expert-led valuation

Given the concerns about representativeness and qualitative evidence as discussed above, it seems appropriate to highlight that standard appraisal procedures may be heavily expert-led, relying not only on evidence but, to some extent, on expert assessment as to the importance and weighting of various criteria, as well as in defining the assumptions which underlie the valuation procedures.

The participatory methods proposed in this paper provide scope to include a wider range of stakeholder views whether capturing monetary or non-monetary values. Although these techniques are still being developed, such inclusive approaches would help capture social impacts and the implications of policies for wellbeing where appropriate indicators and measures of success are harder to define.

In particular, this paper advocates that policy makers might consider using a more inclusive or participatory approach to determining values in circumstances where the value of non-market goods are key to the decision making process (see para 11, Annex 2 of the Green Book). This can benefit the decision making process by making the relative values and weightings for the various impacts more robust, although there are still issues around representativeness of the included stakeholders. Again, this issue can be best addressed by using mixed method approaches in the valuation process.

Conflicting Evidence

When integrating and considering a variety of evidence, it is likely that some of the evidence will draw differing, or even contradictory conclusions. One of the key difficulties when using evidence is determining what is the most relevant to the question you are trying to answer. MCA decision making tools assist with clarifying which is the most pertinent evidence and impacts, thus supporting well-informed judgements.

Trade-offs

The key benefit to monetary valuation is that the use of a common unit that allows trade-offs to be made between different criteria and direct comparison of options. However, there are limitations to the trade-offs that can be made. In some cases, the monetary valuation will be uncertain (have a large range), or very difficult to assess at all due to the type of benefit being valued (for example, with public or shared goods, or aesthetic values).

Omitting evidence which is difficult to monetise or giving undue weight to data which is easier to monetise will result in an inaccurate picture of the likely outcomes of policy options and may lead to poorer policy decisions. The techniques discussed in this paper are offered as a complement to monetised values. They can be used alongside the standard monetised valuation techniques and will help decision makers to make judgements about which is the best value for money option, taking into account all the available evidence. For more information see Annex 2 of the Green Book - Valuing Non Market Impacts.

Although MCA type approaches may avoid the quantification of impacts on a monetary scale, they often use weightings that imply quantification on a scale of utility, so the pitfalls of scaling are not avoided. It is also worth considering that money is not of equal worth in real terms to everybody - the values assigned in willingness-to-pay and contingent valuation exercises have been shown to be highly dependent on context and immediate circumstances (Fish *et al.*, 2011b⁷¹). Add to this consideration of the relative value of a unit of currency, given an individual's income and it may be that there is less objective value in monetary scales than face value would suggest.

Making judgements incorporating both monetised and non-monetised evidence may not always be straightforward, but unless there is a great deal of certainty about the monetary value of costs and benefits, then decisions always require an element of judgement on the part of the decision maker.

⁷¹ Fish *et al.* (2011b). See 16

Inter-generational equity and sustainability

Valuation and appraisal seek to assess the likely impacts of policies into the future. Classical economics applies a discount rate to future impacts, so that impacts further in the future are valued less than those which will occur immediately. This approach has clear implications for future generations, in that although we may value x impact less now, the generation that is contemporaneous to the impact will value it as a present impact (i.e. without a discount rate applied).

Such considerations are of particular importance when dealing with policies that are likely to have very long term impacts, such as environmental policy. Where issues of sustainable development are concerned, others have drawn attention to the difficulty of selecting an appropriate discount rate. Stagl (2007)⁷² argues that in the context of sustainable development, valuation and appraisal tools that use very small or no discount rates should be used. She highlights that when applying the long-term discount factors recommended in the Green Book over a period of 100 years, costs or benefits that would be worth £100 today have a value of merely £5 if they occur in 100 years. Smith (2003; 39)⁷³ suggests that the idea that ethical commitments to future generations should be discounted is particularly problematic.

However, the Green Book states that the main rationale for declining long-term discount rates results from uncertainty about the future (HM Treasury, 2003; 98), and not from concerns about future generations and inter-generational equity. In any case, particularly over long time periods, the discount rate selected will significantly influence the values generated, which therefore can appear arbitrary (see Smith, 2003 for more on this).

Valuation and appraisal is forward looking, and will need to assess likely social impacts of specific interventions and the consequences for wellbeing well into the future. The environment and indicators of sustainability are recognised by the ONS as key to both current and future wellbeing (ONS, 2011b⁷⁴).

⁷² Stagl (2007). See 15

⁷³ Smith G (2003). *Deliberative democracy and the environment*. Routledge, London

⁷⁴ ONS (2011b). See 10

Furthermore, the GES review of the economics of sustainable development recognises the links between economic growth, sustainability and wellbeing (GES, 2010⁷⁵). This approach is clarified in the capitals approach to wellbeing and sustainability (Harper and Price, 2011⁷⁶).

Given these linkages, there is a real risk that if we undervalue future environmental and sustainability impacts, we will increase current wellbeing at the expense of natural capital and the wellbeing of future generations.

The concept of social impacts

There has been some criticism of the concept of 'social impacts' as ill-defined and therefore of little help in considering the impacts of a policy lever. Although it is the case that the term social impact encompasses a wide range of impacts, this does not mean that it is not of use to policy makers. Indeed, such a broad understanding of the impacts of a particular policy or intervention can help bring out the intended and unintended consequences across policy agendas.

The broad conception taken by advocates of this approach helps to address the potentially siloed thinking that government departments can otherwise slip into and for this reason alone it is of great importance to good policy making. Without taking account of the complex and inter-connected nature of policy intervention impacts in the real world, policy makers are at real risk of underestimating the likely unintended consequences of an intervention. In turn, this can leave them at risk of not only making less effective choices, but also of breaching legal obligations, such as those under the Equalities Act 2010.

Current appraisal and assessment procedures take social impacts into account to an extent. However, this paper aims to draw together current thinking on the additional evidence that could be used to better inform decisions and to highlight where certain impacts - those which are less well defined and/or harder to monetise - can be assessed in a more systematic way.

⁷⁵ GES (2010). See 35

⁷⁶ Harper and Price (2011). See 37

The frameworks in Section 2 of this paper provide some guidance towards how to more exactly define this idea and identify relevant social impacts for the particular policy, lever or intervention in question.

6. Conclusions

It is challenging to identify and predict the key social impacts and consequences for wellbeing associated with a range of policy options, over typical appraisal timescales and with robust causal links, and then assess and take into account the full individual and collective value of these implications when making decisions. The concepts of both social impacts and wellbeing are broad, some causal links are difficult to establish even in the present, and some aspects of social impacts and wellbeing do not lend themselves to easy quantification and assessment as part of policy appraisal.

In order to help identify key social impacts and relevant dimensions of wellbeing, the paper has considered a range of frameworks and indicators. In particular, it has outlined the framework developed by the Social Impacts Task Force, approaches being developed by ONS, analysis in the Stiglitz-Sen-Fitoussi report and subsequent work by OECD to develop ways to measure wellbeing. However, in any specific valuation and appraisal context, further work is likely to be required to identify the most relevant criteria and impacts for the individuals and communities most likely to be affected.

This is partly because it is almost impossible to specify in advance all the specific social impacts and aspects of wellbeing that might be relevant in a specific appraisal context. However, this should be viewed as an opportunity either to identify appropriate evidence relevant to the intervention, or to involve relevant specialists and individuals and groups likely to be affected in the appraisal, to ensure the important criteria are correctly identified and included in the analysis.

Where social impacts and wellbeing are likely to be significant, and where key aspects cannot easily or reliably be monetised, the paper has suggested an overall approach based on multi-criteria analysis, as this is the most robust method identified in the Green Book for assessing non-monetary evidence. The paper has proposed two key developments of multi-criteria analysis based on recent research and analysis. First, it has suggested more systematic and integrated use of quantitative and qualitative evidence within the multi-criteria framework and, secondly, enhanced stakeholder participation and deliberation.

Rigorous assessment of quantitative and qualitative evidence will make use of the increasing volume of quantitative wellbeing data that will be available from large scale ONS and other surveys, and findings from the wider evidence base. More systematic and integrated use of qualitative data is considered important for social impacts and wellbeing appraisal, for example to help understand the impacts of policy options for particular groups of people and in specific places. This will also address the recent NAO (2011)⁷⁷ finding, that unstructured qualitative analysis is one of the main weaknesses in current appraisal.

Improved stakeholder participation and deliberation is important because social impacts and wellbeing have significant subjective components, and the best way to understand and assess the impacts associated with particular policy interventions is therefore often to involve the people likely to be affected. There is also increasing recognition that many social impacts and the consequences of policies for wellbeing have collective dimensions, and methods which involve participation and deliberation may be appropriate to assess associated shared and collective values. In addition, stakeholder participation and deliberation are important in social impacts and wellbeing appraisal because political voice, civic engagement and governance are themselves important constituents of wellbeing.

Within this broad multi-criteria based approach incorporating both systematic use of evidence and enhanced stakeholder participation and deliberation, the paper has discussed a range of specific techniques and highlighted the advantages and disadvantages of different methods in different circumstances. However, one of the features of these techniques is that the detailed design often needs to be tailored to specific appraisal requirements.

The methods discussed should enable plural and shared values to be acknowledged and taken into account more systematically in appraisal. The concept of plural values recognises that different individuals and groups have different perceptions, and that the value they place on impacts may differ. Social impacts and wellbeing appraisal needs explicitly to take into account not just aggregate costs and benefits but also the distribution of impacts across different individuals and groups, identified on the basis of a range of socio-demographic, attitudinal, behavioural and other characteristics in addition to

⁷⁷ NAO (2011). See 42

income. At the same time, shared values are important as there is increasing recognition that social impacts and wellbeing have shared collective dimensions that cannot be understood through the assessment of individual impacts alone.

Overall, the techniques discussed in the paper allow for improved identification of appropriate criteria, weighting and option assessment in social impact and wellbeing valuation and appraisal, as well as option development if required. Together, the methods presented represent a broadening of the range of techniques typically used for appraising social impacts and wellbeing, and are intended to help integrate a greater range of quantitative and qualitative non-monetary evidence with monetised values.

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Annex 1. A typology of engagement strategies for public and stakeholder involvement

Engagement strategy	Description	Methods
Strategy 1. Education and information provision	At-distance communication of information and educational material to individual members of the public and stakeholders with no feedback mechanism. Main purpose is to raise awareness and increase understanding. Equally applicable to local through to national scale levels. On its own, informing is a form of engagement but not participation. Information provision often provides essential support to other forms of consultation and participation, however.	<ul style="list-style-type: none"> • Leaflets, brochures, information pack, video, newsletters • Exhibitions/displays (non-staffed) • Advertising • Media (TV, radio, newspapers) • Internet (information provision)
Strategy 2. Consultation (predominantly open to all)	Various approaches to providing information and receiving feedback that are potentially open to all types of participant (ie professional and local stakeholders, and the public). Engagement can either be at-distance or face-to-face (with individuals or groups) and tends to be in the form of one-off events or initiatives. Face-to-face approaches are limited to the local scale (but can reach national coverage if repeated), whereas at-distance approaches can cover all scales from national through to local.	<ul style="list-style-type: none"> • Site visits (for instance, Renn <i>et al</i>, 1993) • Exhibitions/displays (staffed) • Open house • Consultation document • Internet (information/feedback) (for instance, Finney, 1999) • Free telephone line (automated or staffed) • Teleconferencing • Public meeting (see Fiorino, 1990) • Public inquiry
Strategy 3. Consultation (targeting the public/ citizens)	Citizens are targeted through statistically representative samples to take part in quantitative surveys to test 'public opinion', or are recruited to	<ul style="list-style-type: none"> • Questionnaire survey (postal, web-based) • Interview survey (face-to-face, telephone)

	<p>participate in qualitative approaches based on shared demographic features. Quantitative surveys can be at-distance allowing wide national coverage, but lack in-depth reasoned responses. In-depth qualitative approaches allow face-to-face individual or group deliberation and thus tend to be locally situated (but can reach national coverage through multiple processes). These methods can be used in front-end framing to benchmark public opinion and underlying values, issues and concerns; or employed to gauge responses to developments or proposals as the decision process evolves. The researcher provides the link to the decision-maker in the form of a report.</p>	<ul style="list-style-type: none"> • Focus groups (for instance, Morgan and Kruger, 1998) • In-depth groups (for instance, Burgess <i>et al</i>, 1988a; 1988b) • Deliberative opinion poll • Referenda (for instance, Buchmann, 1995)
<p>Strategy 4. Dialogue/deliberation (groups of predominantly local stakeholders)</p>	<p>Methods that seek to engage local stakeholders, selected to represent the interests of others or as surrogates of the 'general public', over extended periods in group deliberation and dialogue. Participants identify local issues and concerns, set priorities and agree on recommendations for action. Some approaches involve stakeholders in framing and actively engaging in technical-analytic aspects of decision processes (for instance, participatory research), while others involve local stakeholders in the evaluation and prioritisation of policy options. In most cases, participants form interactive relationships with decision-makers and specialists.</p>	<ul style="list-style-type: none"> • Community advisory committees (CACs) (for instance, Lynn and Busenberg, 1995; Petts, 1997) • Participatory research (for instance, Brown, 1987; Fischer, 2000) • Planning for real • Visioning • Workshops • Internet dialogue
<p>Strategy 5. Deliberation/dialogue (groups)</p>	<p>Approaches that seek to engage (predominantly) professional stakeholders, selected to represent the</p>	<ul style="list-style-type: none"> • Consensus building and mediation (for instance, Baughman, 1995)

<p>of predominantly professional stakeholders)</p>	<p>interests of others, over extended periods in group deliberation and dialogue. The most common approaches for this strategy are stakeholder workshops and stakeholder dialogue. This strategy also includes approaches that involve stakeholders in framing and actively engaging in technical-analytic aspects of decision processes and/or the evaluation and prioritisation of policy options. Participants predominantly draw on their own information and specialist knowledge. In most approaches, participants form interactive relationships with decision-makers and specialists. This strategy might also include techniques that seek to identify areas of consensus and difference on issues or proposals among groups of professional stakeholders at a distance.</p>	<ul style="list-style-type: none"> • Stakeholder decision analysis (for instance, Clark <i>et al</i>, 1998) • Multi-criteria mapping (for instance, Stirling and Mayer, 2001) • Joint fact finding, and other forms of collaborative analysis (for instance, Baughman, 1995; Busenberg, 1999) • Delphi process (for instance, Rowe <i>et al</i>, 1991; Renn <i>et al</i>, 1993) • Stakeholder dialogue • Workshops • Internet dialogue
<p>Strategy 6. Deliberation/dialogue (groups of citizens and specialists)</p>	<p>Innovative deliberative approaches that engage citizens, often recruited to be representative of the wider public, in panels over extended periods of responsive information provision, considering issues and providing recommendations to decision-makers. Citizens interact with specialists (or experts) at various points throughout the process - available methods differ in the degree and nature of this interaction and thus the extent of mutual learning and capacity building between panellists and specialists. Some methods have been developed for national-level policy, while others are only established at local geographic scales (but have the</p>	<ul style="list-style-type: none"> • Deliberative mapping (for instance, Davies <i>et al</i>, 2003; Burgess <i>et al</i>, 2004; Davies and Burgess, 2004) • Consensus conference (for instance, Joss and Durrant, 1995; Guston, 1999) • Citizens' juries (for instance, Crosby, 1995; Coote and Lanaghan, 1996) • Citizens' panels/planning cells (for instance, Diemel and Renn, 1995) • Research panels

	potential to be scaled up).	• Interactive panels
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Source: Burgess and Chilvers (2006; 720)⁷⁸

⁷⁸ Burgess and Chilvers (2006). See 59

Annex 2. Case studies from a range of policy areas

This annex discusses the following four case studies:

- Transport appraisal including social and distributional impacts guidance
- Radioactive waste management
- Natural resource planning, Goulburn-Broken Catchment, Victoria, Australia
- Organ transplantation options

The case studies have been chosen to illustrate the approach and methods described in the paper, and to reflect a diverse range of policy areas, spatial scales, and aspects of social impacts and wellbeing (see Table A1).

Overall, the case studies demonstrate the practical application of a multi-criteria analysis framework and the benefits of detailed guidance in specific policy areas. They illustrate a range of ways in which diverse forms of evidence can contribute to the valuation and appraisal of social impacts and the consequences of policies for wellbeing. Together, they highlight ways in which enhanced stakeholder participation and deliberation can contribute to the framing of policy issues, weighting of criteria, and refining and improving options, as well as assessing performance across different objectives using monetary values and non-monetary evidence.

Table A1 Case study characteristics

Case study	Policy area	Spatial scale	Headline types of social impacts and wellbeing criteria
Transport appraisal including social and distributional impacts guidance	Transport	Local	<ul style="list-style-type: none"> • Economy • Environmental • Social • Public Accounts • Specific social and distributional impacts sub-criteria
Radioactive waste management	Energy	National	<ul style="list-style-type: none"> • Public Safety, Individual - short term (up to 300 years) • Public Safety, Individual - long

			term (longer than 300 years) <ul style="list-style-type: none"> • Worker Safety • Security • Environment • Socio-Economic • Amenity • Burden on Future Generations • Implementability • Flexibility • Costs
Natural resource planning, Goulburn-Broken Catchment, Victoria, Australia	Natural environment	Local	<ul style="list-style-type: none"> • Ecosystem Services: Water Quality; Water Quantity; Biodiversity and Aesthetics • Social/Cultural: Public Access; Jobs; Cultural & Heritage; Education • Economic: Costs; Benefits
Organ transplantation options	Health	National	<ul style="list-style-type: none"> • Ethical acceptability • Patient outcomes • Economic • Public safety • Feasibility • Capacity • Equity • Socio-political motivation • Information and Transparency • Wider Benefits • Other Social Impacts

Annex 2.1 Transport appraisal including social and distributional impacts guidance

DfT’s transport appraisal framework and supporting guidance aims to bring together a full range of monetary, quantitative, and qualitative assessments into an overall framework to support transport decision making. As part of this,

detailed guidance on the Social and Distributional Impacts (SDIs) of transport interventions was released in January 2010 and updated in April 2011⁷⁹.

The full WebTAG guidance is online and currently runs to almost 1,500 pages⁸⁰. An overall summary of the appraisal approach can be found in the following TAG units:

- TAG Unit 2.5 - The Appraisal Process
- TAG Unit 2.7.1 - Transport Appraisal And The Treasury Green Book
- TAG Unit 3.2 - Appraisal

An earlier version of the transport appraisal approach is provided as a case study in the MCA manual first published by DTLR in 2000, so has stood the test of time.

Overall, transport schemes are assessed using a multi-criteria approach against a wide range of broad criteria. The broad appraisal criteria and sub-criteria are:

- **Economy:** Business users and transport providers; Reliability impact on business users; Regeneration; Wider impacts
- **Environmental:** Noise; Air quality; Greenhouse gases; Landscape; Townscape; Heritage of historic resources; Biodiversity; Water environment
- **Social:** Commuting and other users; Reliability impact on commuting and other users; Physical activity; Journey quality; Accidents; Security; Access to services; Affordability; Severance; Option values
- **Public Accounts:** Cost to broad transport budget; Indirect tax revenues

Detailed WebTAG impact assessment guidance is available in each of these areas. Impacts are expected to be assessed using monetary, quantitative and qualitative data, and those carrying out the analysis are required to record a summary of key impacts in an Appraisal Summary Table. The Appraisal Summary Table provides a high level monetary, quantitative and qualitative assessment of the scheme for each of the relevant appraisal criteria.

⁷⁹ DfT (2011). See 38

⁸⁰ <http://www.dft.gov.uk/webtag>

The guidance for assessing Social and Distributional Impacts sits within this overall appraisal framework, and so social and distributional impacts are assessed systematically for all transport schemes where the Transport Appraisal Guidance applies.

The Social and Distributional Impacts guidance specifies that transport schemes should be assessed against the following SDI criteria: User benefits; Noise; Air quality; Accidents; Security; Severance; Accessibility; and Personal affordability. Those carrying out the impact assessment are provided with detailed information on the potential for social and distributional impacts in each of these areas, and the specific issues that might arise (see for example DfT, 2011; pages 7-8).

The guidance indicates that the analysis should identify the impacts on particular groups of people in the area affected by the intervention. Table A2 shows the groups of people that should be included, based on the indicators that have been scoped for SDI analysis. For example, if the only in-scope SDI impact is 'User benefits', it is necessary only to prepare mapping of the distribution of different income groups in the affected area. If 'Accidents' have been identified as being an in-scope impact, it is necessary to prepare mapping of the proportions of children, young adults and older people within the affected area.

The guidance gives detailed information on how these impacts should be accessed and useful data sources.

If potential social and distributional impacts are identified for full appraisal following the screening process, the appraisal of these impacts is undertaken in accordance with the requirements of the respective TAG Units: each TAG unit includes a module to describe the work required to describe the social and distributional impacts for each indicator (e.g., TAG Unit 3.5.3 for User benefits, TAG Unit 3.3.2 for Noise, etc).

In the case that a more qualitative approach to appraisal has been identified, the guidance states that the SDI analyst should develop a proportionate approach that will provide adequate information on the social and distributional impacts of each of the impacts of interest.

Following detailed analysis, the final step is collation of the SDI analysis into a matrix of social and distributional impacts, which is accompanied by qualitative statements for each of the SDI criteria. For each of the impacts assessed, the TAG Units provide an approach that should be followed by the SDI analyst in assigning qualitative scores for each of the social groups under consideration. For each impact, and for each of the social groups under consideration, an impact score is determined as follows:

- Large beneficial / Moderate beneficial / Slight beneficial
- Neutral
- Slight adverse / Moderate adverse / Large adverse

An example of a matrix of Social and Distributional Impacts is shown in Table A3.

Table A2 Scope of socio-demographic analyses for Social and Distributional Impacts

Dataset / social group (Shading indicates analysis required for each impact)	User benefits	Noise	Air quality	Accidents	Security	Severance	Accessibility	Affordability
Income distribution								
Children: proportion of population aged <16								
Young adults: proportion of population aged 16-25								
Older people: proportion of population aged 70+								
Proportion of population with a disability								
Proportion of population of Black and Minority Ethnic (BME) origin								
Proportion of households without access to a car								
Carers: proportion of households with dependent children								

Source: DfT (2011; 13)

Table A3 An example of a matrix of Social and Distributional Impacts

Key to impacts:

- ✓✓✓ Large Beneficial × Slight Adverse
- ✓✓ Moderate Beneficial ×× Moderate Adverse
- ✓ Slight Beneficial ××× Large Adverse

Impacts	DISTRIBUTIONAL IMPACTS					SOCIAL IMPACTS									
	Income Groups (Income Domain)					User Groups			Social Groups						
	Most Deprived		← → Least Deprived			Pedestrians	Cyclists	Motorcyclists	Children and Young People	Young Men	Older People	Carers	Women	People with Disabilities	Black and Minority Ethnic
	0 – 20%	20 – 40%	40 – 60%	60 – 80%	80 – 100%										
User benefits	✓	✓✓	✓✓	✓✓	✓✓✓										
Noise	xxx	✓	✓✓✓	✓✓	✓✓✓				x						
Air quality	✓✓✓	✓✓✓	✓	xxx	✓				✓✓						
Accidents						✓	✓	✓	✓	✓	✓✓				
Security									✓✓		✓		✓✓		
Severance									x		xx		Xx		
Accessibility									✓		✓✓✓	✓	✓	✓✓✓	
Affordability	xx	X	xx	✓	✓✓										

Source: DfT (2011; 28)

Annex 2.2 Radioactive waste management

Radioactive waste management has been the subject of a number of MCA decision-making processes. Unlike the other case studies in this paper, this section provides an overview of a number of studies over almost two decades, and shows a move over time towards in-depth processes that involve wider stakeholder and public engagement.

The MCA manual (CLG, 2009⁸¹) discusses a case study undertaken for Nirex in the 1980s aiming to recommend a shortlist of possible sites for underground storage of radioactive waste. The case study was undertaken by the Decision Analysis Unit at the London School of Economics and used an MCDA approach with five facilitated workshops with specialist stakeholders held between September and November 1988.

⁸¹ CLG (2009). See 14

The MCA manual states that out of all the analyses undertaken, a set of three options were developed to be presented to the Nirex Board. Each of the three options included the Sellafield B site. In addition, each options included either 'Site 6' or 'Site 7', and either Dounreay or 'Site 2'. However, in early 1989, the Secretary of State for the Environment decided that only Sellafield B and Dounreay would be considered further. Subsequently, in summer 1990, Nirex announced that it was concentrating only on Sellafield B.

In 1994, following extensive data collection, Nirex recommended an underground laboratory should be built at Sellafield to further verify their findings in situ. However, Cumbria County Council did not grant planning permission and the proposal was taken to a public inquiry. At the inquiry, which was completed in early 1995, the inspector took the view that at least one of the other potential sites should have been considered alongside Sellafield, and used the findings of the MCDA to highlight the appeal of Site 6. The inspector also specifically indicated that greater emphasis should have been given to safety, and upheld Cumbria's refusal.

At the public inquiry, Greenpeace criticised the decision to limit the MCDA to specialists. During the MCDA, the specialist participants had identified all the stakeholders relevant to the analysis, including the Nirex Board, Treasury, regulatory bodies, politicians, local residents and local authorities, national environmental organisations, representatives of the scientific and technical community, and other European countries. The facilitators had invited the group 'to role play any of these stakeholders and write down five factors that should be taken into account in evaluating sites' (CLG, 2009; 93). However, it is likely that safety would have been given more weight in the analysis if these stakeholders had been able to participate directly.

Deliberative Mapping

The Committee on Radioactive Waste Management (CoRWM) incorporated participatory processes in further considering radioactive waste management from 2003.

Burgess and Chilvers (2006)⁸² led a two day workshop in Manchester in March 2003 to help develop CoRWM's public and stakeholder engagement strategies, including consideration of early findings from the *GM Nation?* debate. The workshop involved forty-three experts in participatory processes, policy-makers and representatives from major stakeholder organisations. Participants designed three alternative engagement strategies, each of which would allow both citizens and stakeholders to participate in the appraisal of options for managing radioactive waste.

Participants in the workshop emphasised that deliberation between citizens and specialists (Strategy 6 identified in Section 3.4; also see Annex 1) is 'essential in contentious and uncertain decision contexts such as radioactive waste, and argued that such intensive processes should be integrated with extensive techniques to ensure widespread engagement of the UK public' (Burgess and Chilvers, 2006; 721).

The outputs from the workshop were taken into CoRWM's outline planning of its work programme in 2004. It is worth noting that the majority of CoRWM members were interested in exploring the potential for a participatory, multi-criteria appraisal process with citizens to compliment analysis by technical experts. As discussed in Section 3.4, Deliberative Mapping is an advanced analytic-deliberative process that combines use of participatory techniques and multi-criteria analysis. A full-scale trial of Deliberative Mapping to assess the potential for this technique to contribute to CoRWM's appraisal of policy options was completed in summer 2004 (Burgess *et al.*, 2004⁸³).

Three stage multi-criteria analysis

CoRWM undertook a multi-criteria analysis to appraise options for managing the UK nuclear waste inventory, including a decision conference attended by

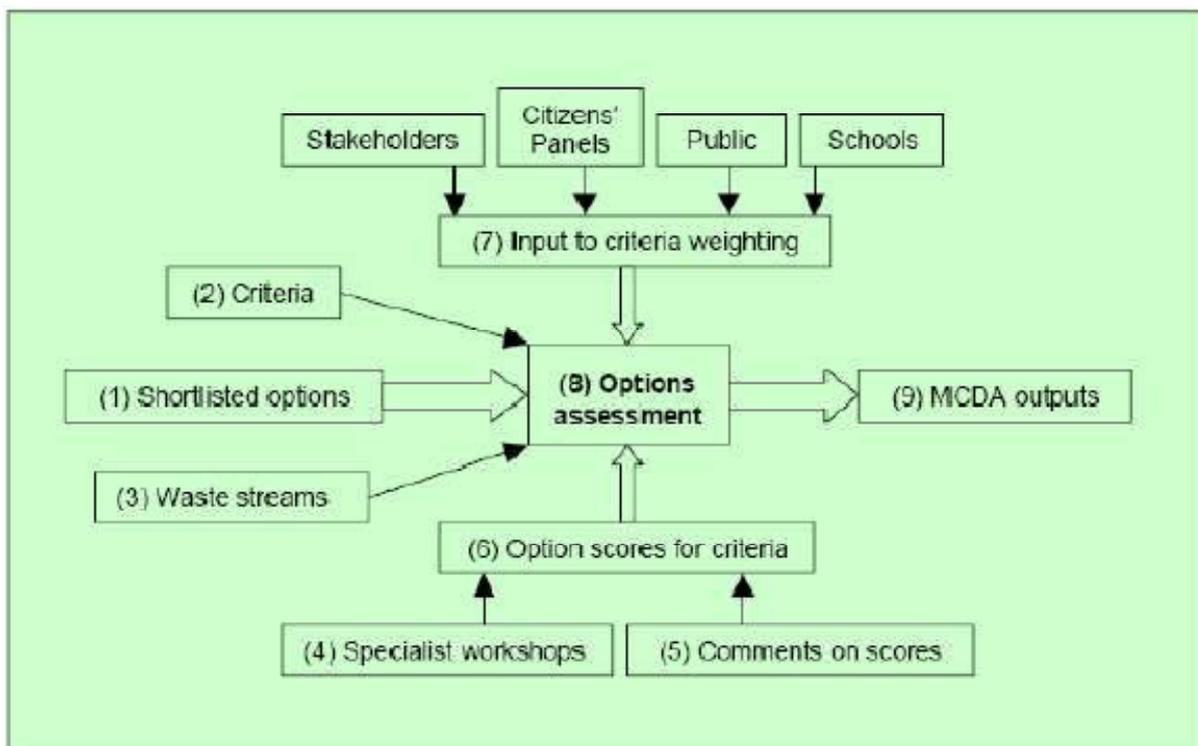
⁸² Burgess and Chilvers (2006). See 59

⁸³ Burgess J, Chilvers J, Clark J, Day R, Hunt J, King S, Simmons P and Stirling A (2004). Citizens and specialists deliberate options for managing the UK's intermediate and high-level legacy radioactive waste: a report of the Deliberative Mapping Trial, June-July 2004. CoRWM Report 585.1. CoRWM, London

nine CoRWM members held on 28-30th March 2006 (Stagl, 2007⁸⁴; Phillips *et al.*, 2006⁸⁵). Figure A1 summarises the full multi-criteria process.

The shortlisted options considered in the process were developed through an extensive process of debate and discussion which included citizens, stakeholders and other experts. The 14 options developed fell into three broad categories. First, a set of options were developed for interim storage only, up to a maximum of 300 years. Most of these were above-ground stores. The second and third categories were for permanent disposal options. Geological disposal options included deep boreholes and non-geological disposal included a range of near-surface and shallow disposal options (Table A4).

Figure A1 Overview of the CoRWM multi-criteria process



Source: CoRWM (2006, cited in Stagl, 2007; 33)

⁸⁴ Stagl (2007). See 15

⁸⁵ Phillips L, Egan M and Airoidi M (2006). MCDA Decision Conference, 28-30th March 2006. Report COR006. CoRWM, London

Table A4 Fourteen options considered in the multi-criteria analysis

Interim Storage (up to 300 years)	Geological Disposal	Non-geological Disposal
1. Local, above-ground stores 2. Centralised above-ground store 3. Local, protected, above-ground stores 4. Centralised, protected above-ground store 5. Underground, local stores 6. Centralised, underground store	7. Geological disposal 8. Deep borehole disposal 9. Phased geological disposal	10. Local, near-surface vaults 11. Centralised, near surface, protected vault 12. Mounded over reactors 13. Shallow vault, centralised 14. Shallow vault, local

Source: Phillips *et al.* (2006)

Phillips *et al.* (2006) emphasise that a great deal of work with citizens, stakeholders and specialists was also involved in developing the 27 option appraisal criteria. The 27 sub-criteria were grouped into 11 categories, as shown in Table A5. The headline criteria represent the objectives for disposal: to ensure public safety up to 300 years, to ensure public safety beyond 300 years, to ensure worker safety, and so on.

Stagl (2007) outlines how the scoring of policy options was undertaken by experts. A series of specialist workshops was organised, with representatives from the industry, regulators, private sector consultancies, academic experts and NGOs. Appropriate briefing material was prepared to inform discussion at each workshop. CoRWM's Integration Group determined the weights, informed by citizen and stakeholder views, and aided by the use of Hiview software.

The overall findings from the multi-criteria policy appraisal process were: '(1) Overall, geological disposal options ranked higher than storage options. (2) The difference in ranking between geological disposal and storage was substantial for most waste streams and for most of the limiting case sector scenarios. (3)

Generally, the borehole option was the lowest ranked geological disposal option' (Stagl, 2007; 33).

A sample output of results is shown in Figure A2. In summary, and as discussed in Section 3.4, Stagl (2007; 34) states that 'this method is most suitable for the appraisal of policies, programmes or projects whose impacts are reasonably well understood by experts and which contain a significant technical element. Three-stage multi-criteria analysis was developed for the social appraisal of technologies with particular emphasis on the role of risk and uncertainty'.

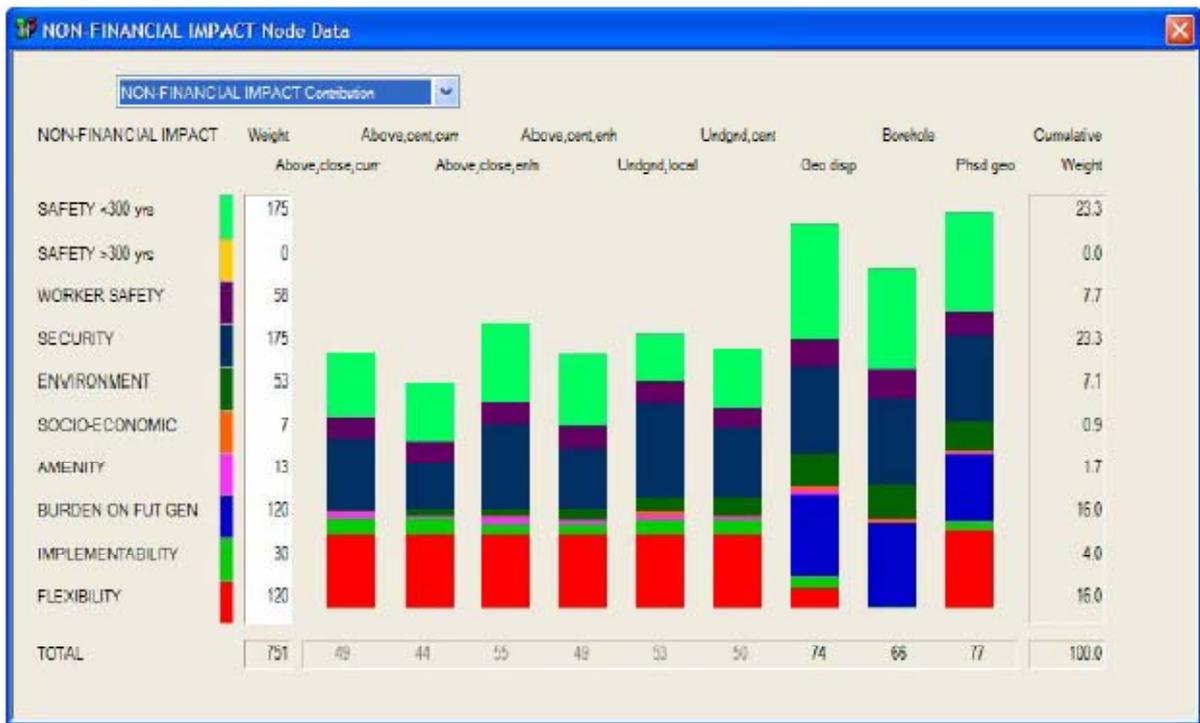
Table A5 Headline criteria and sub-criteria

Headline Criterion	Sub-Criterion
1 Public Safety, Individual - short term (up to 300 years)	1 Radiation
	2 Non-radiation
2 Public Safety, Individual - long term (longer than 300 years)	3 Radiation
	4 Radiation
3 Worker Safety	5 Non-radiation
	6 Misappropriation
4 Security	7 Vulnerability to terrorist and other attack - pre-emplacment of waste
	8 Vulnerability to terrorist and other attack - post emplacment of waste
	9a Radiological pollution <300 years
	9b Radiological pollution >300 years
5 Environment	10 Chemical pollution
	11 Physical disturbance
	12 Use of natural resources
	13 Employment employ people over the option's lifetime
	14 Spin-off
7 Amenity	15 Visual
	16 Noise
	17 Transport
	18 Land take
8 Burden on Future Generations	19 20 Costs & Effort
	21 Worker Dose

	22 Environmental impact
9 Implementability	23 Technical
	24 Regulatory requirements
10 Flexibility	25 Flexibility
11 Costs	26 Costs

Source: Phillips *et al.* (2006)

Figure A2 The overall result for the High Level Waste model



Source: Phillips *et al.* (2006; 19)

Annex 2.3 Natural resource planning, Goulburn-Broken Catchment, Victoria, Australia

This case study centres on natural resource planning in the Goulburn-Broken Catchment in Victoria, Australia. The method used is called Deliberative Multi-criteria Evaluation and is based on a combination of the Citizens' Jury technique and Multi-criteria Evaluation. In this case, the participants in the jury were natural resource managers rather than members of the public, so this part of

the approach is termed a Stakeholder Jury (Proctor, 2003⁸⁶; Proctor and Drechsler, 2006⁸⁷; also see Fish *et al.*, 2011a⁸⁸).

The study was undertaken to assess options for natural resource management in the context of recreation and tourism, and aimed to assess ecosystem services, social and cultural issues, and economic impacts of potential management options. The Deliberative Multi-criteria Evaluation was part of a larger study assessing the nature and value of ecosystem services in Australia (Proctor and Drechsler, 2006).

Proctor and Drechsler describe the Goulburn-Broken Catchment as covering approximately 2.4 million ha between Melbourne and the Murray River. The catchment has a population of around 200,000 and experiences a range of significant environmental problems including salinity, rising water tables and poor water quality. Land use in the catchment is diverse, and includes dairy farming, horticulture, dryland grazing, arable farming and hobby farming, as well as tourism and recreational uses in the southern highland areas. This latter part of the catchment is the subject of the case study, and is known as the 'upper catchment'.

The upper catchment provides people from Melbourne with the opportunity to undertake outdoor activities including skiing, four-wheel driving, bushwalking, camping, horseriding and sightseeing. Around two million tourists visit the area each year, but this has caused a range of serious environmental problems, many of which are related to water. Since the Goulburn and Broken Rivers flow into the Murray River, the problems in the upper catchment may also affect water as far away as Adelaide (Proctor and Drechsler, 2006).

Proctor (2003) outlines a series of recreation and tourism management options that were developed by natural resource managers at an options workshop held prior to the jury. The options were:

⁸⁶ Proctor (2003). Ecosystem services supporting tourism and recreation. In: Abel N *et al.* Natural values: exploring options for enhancing ecosystem services in the Goulburn Broken catchment. CSIRO Sustainable Ecosystems, Canberra, 83-96.

http://www.ecosystemservicesproject.org/html/publications/docs/nveo/Natural_Values.pdf

⁸⁷ Proctor and Drechsler (2006). Deliberative multicriteria evaluation. *Environment and Planning C: Government and Policy* 24, 2, 169-190

⁸⁸ Fish *et al.* (2011a). See 8

- **Business as usual (Current):** This option is the current scenario for recreation and tourism management in the region. Concerns associated with this option include the effects of increasing numbers of tourists, easier access as a result of improved vehicles and better roads, and increased international demand for tourism opportunities in the area
- **Maximise ecosystem services outcomes (Max ES):** This option represents a policy of preventing access to any of the threatened recreation and tourism sites in the region. For example, this would prevent access to national parks and state forests
- **Maximise social outcomes (Max S):** This option aims to generate employment for local people in recreation and tourism industries, including in activities such as ecotourism, four wheel driving, camping and environment education, and through expansion of local hospitality and accommodation provision
- **Maximise economic outcomes (Max Ec):** This option allows access to all areas and therefore maximises profits for the recreation and tourism industry in the short term
- **Sustainable tourism/environment/society mix (Mix):** This option aims to balance environmental, economic and social concerns

The options workshop also identified appropriate criteria against which to assess the options (see Table A6). Table A6 was populated using data from a range of experts. Experts who provided input were from public sector natural resource and forestry organisations, water management bodies, and private sector consultancies with experience in the region. The format included both qualitative and quantitative indicators, and allowed ranges for some indicators where data were uncertain (Proctor, 2003). This demonstrates good use of both quantitative and qualitative evidence in the assessment process, as discussed in Section 3.3.

Table A6 Impact matrix

		Ecosystem Service Scenarios				
Criteria	Indicators	Curr.	Max ES	Max S	Max Ec	Mix
Ecosystem Services						
Water Quality	mg/L P	0.02	0.005	0.05	0.1	0.01
Water Quantity	Discharge 000 ML	150	250	100	125	150
Biodiversity/ Native Biota	10 = High 1 = Low	6	10	3	5	10
Sediment Filtration	10 = High 1 = Low	3	8	6	8	8
Erosion control	10 = High 1 = Low	7	10	7	4	7
Nutrient Management/ waste assimilation	10 = High 1 = Low	3	8	7	3	8
Shading	10 = High 1 = Low	5	10	6	2	8
Stream Health including instream and riparian zones	ISC Very poor: 0-19 Poor: 20-25 Moderate: 26-34 Good: 35-41 Very Good: 42-50	35-41	42-50	35-41	26-34	35-41
Aesthetics/scenic views	10 = High 1 = Low	5	8	6	2	7
Social/Cultural						
Public Access	10 = High 1 = Low	5	1	7	10	5
Jobs	No. '000	15	18	20	25	18
Cultural & Heritage*	0 = not maint. 1 = maintained	0	1	1	0	1
Education*	0 = not present 1 = present	0	0	1	0	1
Economic						
Costs	\$mill	2.5-3.5	0	25-3.5	0	18.3
Benefits	\$mill	5.5-6.5	0	6.4-49	4.3-40.1	9-57.3

* These were added after the initial ranking process at the request of one of the jurors.

Source: Proctor (2003; 90)

At the Stakeholder Jury, participants considered the impact matrix and further information provided to them by experts. Overall, the day was divided into two separate sessions. In the morning, jurors heard expert presentations and took part in facilitated discussions. In the afternoon, participants were guided through iterations of weighting the criteria, using Multi-criteria Evaluation software to aid the process and enable jurors to understand the effects of varying their inputs.

Proctor (2003) states that during this process, it was decided that the original ecosystem services criteria shown in Table A6 could be reduced to four. These were: Water Quality, Water Quantity, Biodiversity and Aesthetics.

The final weighting of criteria by the individual jurors is shown in Figure A3 and final mean scores in Figure A4. It can be seen that the favoured outcome was the Mix option. Proctor (2003) states that uncertainty also decreased during the process and that smaller standard deviations at the end of the process indicate greater consensus than at the start. It is clear that the business as usual option performed worst of all, with the second worst option being to maximise economic outcomes, albeit narrowly defined and short-term economic outcomes.

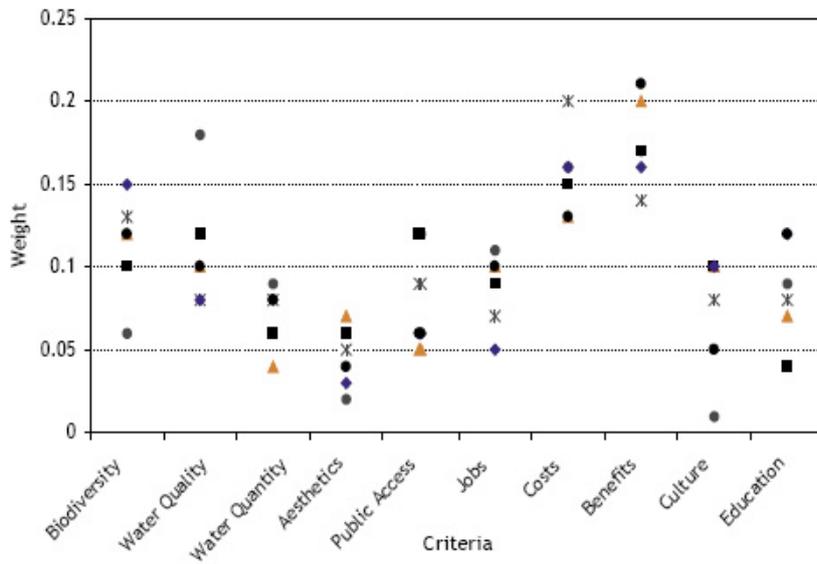
It is also worth noting that even though members of the jury were all natural resource managers, the option to maximise ecosystem services outcomes was the middle ranking option, scoring below the option to maximise social outcomes and the mixed option. Once again, however, the maximise ecosystem services outcomes option is narrowly defined, and in fact aims to maximise ecosystem protection.

Fish *et al.* (2011a) conclude that the key point of this case study is that when MCA techniques are combined with deliberative processes then non-monetary values can begin to be incorporated in decision-making. In this case, where the criteria and options have been assessed in non-monetary terms, the option to maximise economic outcomes has scored less favourably than other options, and so taking non-monetary factors into account appears to have influenced the final preferred option. Although it would have been possible to monetise some of the ecosystem services and social/cultural impacts in the study, it would have

been difficult to monetise them all and so some factors taken into account in this study would be unlikely to appear in a standard cost benefit analysis.

Figure A3 Weighting of criteria

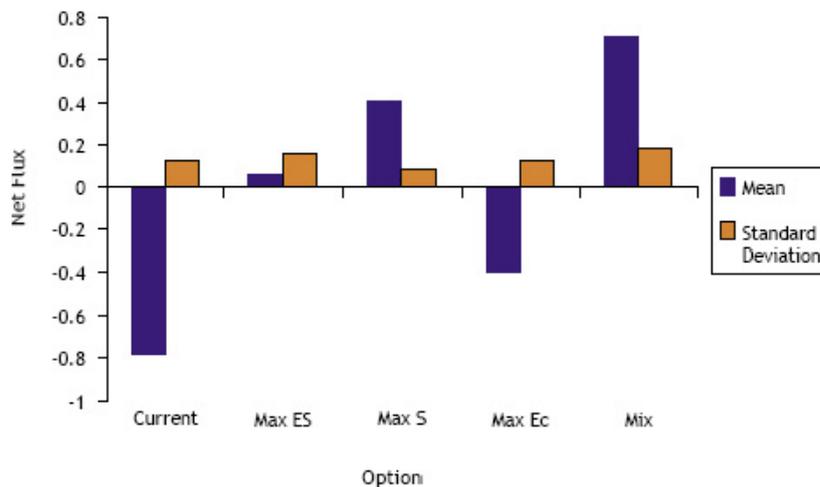
Note: Each symbol represents a different juror



Source: Proctor (2003; 95)

Figure A4 Final score and uncertainty of options

Options: Current; Max ES = Maximise ecosystem service outcomes; Max S = Maximise social outcomes; Max Ec = Maximise economic outcomes, Mix = Sustainable tourism/environment/society outcomes



Source: Proctor (2003; 95)

Annex 2.4 Organ transplantation options

Participatory and deliberative approaches have been used extensively in the field of health at national and local level, in a wide range of different contexts. For example, at national level, citizens have been involved in technology appraisal, while at local level, residents have been involved in determining health care priorities and patients involved in shared decision-making with general practitioners (Davies and Burgess, 2004⁸⁹).

This case study was undertaken by Burgess and colleagues (Davies *et al.*, 2003⁹⁰; Burgess *et al.*, 2007⁹¹; also see Stagl, 2007⁹²) and used Deliberative Mapping

⁸⁹ Davies and Burgess (2004). See 20

⁹⁰ Davies G, Burgess J, Eames M, Mayer S, Staley K, Stirling A and Williamson S (2003). Deliberative Mapping: appraising options for addressing 'the kidney gap'. Final Research Report to Wellcome Trust. Deliberative Mapping. <http://www.deliberative-mapping.org>

⁹¹ Burgess J, Clark J, Davies G, Eames M, Staley K, Stirling A and Williamson S (2007). Deliberative mapping: a novel analytic-deliberative methodology to support contested science-policy decisions. *Public Understanding of Science* 16, 3, 299-322

⁹² Stagl (2007). See 15

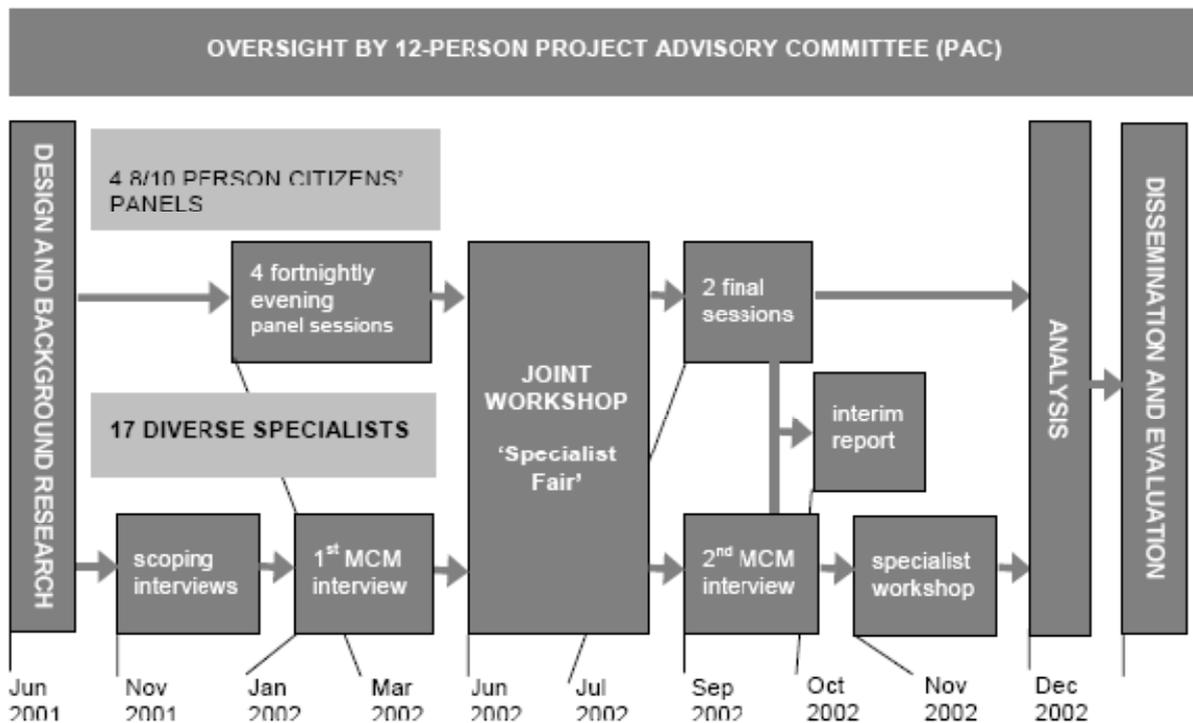
(DM) to examine organ transplant options. The DM process focused on appraising a range of options for addressing 'the kidney gap'. This is the difference between the number of people needing a new kidney and the number available.

Burgess *et al.* (2007) describe how DM is based on two previous methodologies. First, multi-criteria mapping (MCM), which was discussed in Section 3.4, is a technique based on interviews with stakeholders and specialists. It seeks to elicit detailed technical and evaluative judgements and aims to understand uncertainty and the diversity of views on an issue as a central part of appraisal (Stagl, 2007). Second, stakeholder decision analysis (SDA) is a group-based technique employing a qualitative form of multi-criteria analysis and is also discussed in Section 3.4. Burgess *et al.* state that MCA and SDA both follow an overall multi-criteria analysis approach, including discussion of ways to frame the problem, development of options, identifying criteria and performance assessment.

The case study project involved two workstreams. One of these involved specialists with relevant expert knowledge. The other involved members of the public who had diverse experience and knowledge but not in the fields of patient health, biotechnology or medicine (Burgess *et al.*, 2007). Figure A5 illustrates the various components and stages of the study. Scoping interviews were undertaken with the specialists, followed by two MCM interviews. Members of the public joined one of four citizens' panels, each of which had between eight and ten people. Each citizens' panel met six times and followed a modified SDA process. After four of the citizens' panel sessions and between the MCM interviews, all participants in the project met for a joint workshop.

The research team also assembled a Project Advisory Committee (PAC) to guide the project. This had 12 members with a wide range of interests in the issue, including medical experts, community development workers, and representatives from biotechnology companies and NGOs (Burgess *et al.*, 2007).

Figure A5 Summary of the components and stages of the Deliberative Mapping project



Source: Davies *et al.* (2003; 50)

Burgess *et al.* (2007) describe in detail the steps in the participatory multi-criteria option appraisal process, and the tasks undertaken by citizens, specialists and the research team at each stage. The process included discussing ways to frame the problem, development of options, identifying criteria and assessing the performance of the different options.

Table A7 shows the set of six 'common' options and four 'discretionary' options developed by the research team in consultation with the PAC and taking into account wider academic evidence. The 'common' options were assessed by citizens and specialists and the 'discretionary' options were appraised by all participants if they wished.

Table A7 Summary of ‘common’ and ‘discretionary’ options for appraisal

Common options
Option 1. Improved transplant services. Improving existing services, learning from international best practice.
Option 2. Altruistic living donation. Increasing the number of donors through voluntary unpaid living donation.
Option 3. Presumed consent. Increasing the number of donors by giving the medical profession a greater role in making decisions about organ donation.
Option 4. Xenotransplantation. Cross-species transplantation using organs from genetically-modified pigs.
Option 5. Embryonic stem cells. Human tissue engineering using human embryonic stem cells to repair or build kidneys.
Option 6. Encouraging healthier living. A preventative approach, involving health education and primary care to help reduce chances of kidney disease.
Discretionary options
Option 7. Improved kidney machines. Building bio-artificial machines that function more like a real kidney.
Option 8. Adult stem cells. Using stem cells from adult humans to repair or build kidneys.
Option 9. Rewarded giving. Providing a small economic incentive for consent to organ donation after a person’s death.
Option 10. Accepting death. Placing greater emphasis on dying with dignity.

Source: Burgess *et al.* (2007; 305)

Criteria were developed in the specialist interviews and citizens’ panels. In the specialist interviews, experts were asked to make personal judgements about the criteria that were important in assessing the various options. In the citizens’ panels, an iterative process of negotiation sought to ensure that no criteria were ‘lost’. Following discussions, the research team drafted concise definitions that were taken back to the group for approval in the subsequent meeting (Burgess *et al.*, 2007). Overall, eleven broad groups of criteria were developed as shown in Table A8.

These broad criteria groups varied in importance for citizens and specialists. Feasibility, ethical acceptability and economic criteria were important for citizens and specialists. The citizens’ panels considered public safety and wider benefits to be high priority, while specialists prioritised patient outcomes and

capacity. Equity, information and transparency, socio-political motivation and other social impacts were lower priority for both groups (Davies *et al.* 2003).

Burgess *et al.* (2007) describe how the performance of each option was assessed by specialists and citizens. Specialists gave a numerical score to each option for each selected criterion. The values for each criterion were normalised using specialist software, and the results displayed during interviews. Citizens provisionally scored all options against the agreed criteria in their fourth session, also on an individual basis. In the citizens' panels, the research team facilitated discussion, scores were displayed to enable people to compare their assessments, and issues were identified to raise with specialists at the joint workshop. Following the workshop, in the fifth session, participants reviewed their assessments and were able to make changes based on what they had learnt at the workshop and through discussion.

Table A8 Criteria groups developed through the specialist interviews and citizens' panels

<p>Ethical acceptability: This group of criteria addresses a range of acceptability criteria on the part of the individual respondent, the public, patients or relevant professions. They include moral questions about consent (donor and family), coercion (of donors), animal welfare, nature/culture boundaries, other socio-political issues and general notions of the 'good society'.</p>
<p>Patient outcomes: This group of criteria combines issues around medical success and patient quality of life. These are linked because medical success is a means to enhancing long-term patient quality of life. These are sometimes based on established clinical quality of life scales and sometimes more broadly defined, where appropriate including issues around 'quality of dying'.</p>
<p>Economic: This group of criteria concerns the cost of the option in broad monetary terms. Various accounted for at the level of the Health Service, extended to include the research system or others on whom explicit costs fall, or encompassing hidden costs for society as a whole.</p>
<p>Public safety: This group of criteria addresses implications for the safety of non-patients. It includes issues such as infection risks or other unintended or unanticipated public health impacts and health effects of surgery, etc., on living donors.</p>
<p>Feasibility: This group of criteria raises issues around the scientific, technical, legal, institutional and political viability of a particular option. It involves consideration of the prospects that it will actually work in practice and considerations of the timeliness with which it will become practically available.</p>

<p>Capacity: This group of criteria concerns the effect of any given option in straightforward terms of the contribution made to increasing the number of organs available (or reducing the need) for transplant. It excludes wider issues of success.</p>
<p>Equity: This group of criteria concerns the extent to which organs will be supplied to those in greatest medical need rather than on some other basis, such as ability to pay. Also includes issues around the contribution to redistribution of economic wealth within UK society and globally.</p>
<p>Socio-political motivation: This group of criteria relates to the underlying motivations or interests that might benefit from a certain option. These interests or motivations may be economic, social or political.</p>
<p>Information and Transparency: This group of criteria considers the extent to which transparent and accessible information is available upon which the public can base their judgements.</p>
<p>Wider Benefits: This group of criteria relates to benefits that may be gained from an option more widely than for organ donation. For example, information about more healthy lifestyles will protect against other illnesses; scientific research may produce results that are more widely applicable than organ transplantation.</p>
<p>Other Social Impacts: This group of criteria addresses other, wider, social impacts not covered under ethical acceptability, wider benefits, economic or public safety criteria groupings. It includes considerations such as impacts on families and carers, which are not captured in economic measures, and includes consequences for society as a whole of becoming increasingly dependent on the products of scientific and technical expertise</p>

Source: Davies *et al.* (2003; 97)

Burgess *et al.* (2007) state that the key findings from the study illustrate remarkable consistency in the performance of different options across specialists and citizens' panels. Overall, even though the groups had quite different perspectives, the four 'institutional' options performed much better. Figures A6-A8 show selected illustrative results, while full results can be found in the final report from the project (Davies *et al.*, 2003).

In relation to the individual 'institutional' options, Burgess *et al.* (2007) state that 'Improved transplant services' was the best option for all four citizens' panels or a very close second, and was also the favoured option among specialists as a whole. 'Encouraging healthier living' was in the top two options for three of the citizens' panels and was ranked third by the other citizens' panel. This option was also ranked in the top two overall by specialists, being

particularly favoured by ethicists and 'wider stakeholders', although less so by healthcare policy specialists.

'Presumed consent' and 'Altruistic living donation' also scored highly overall, although there was slightly more variation with these options. 'Presumed consent' was scored joint highest by the C2D men's panel and the 'wider stakeholder' group of specialists, but was scored less highly by other panels and was only a mid-ranking options for specialists overall. It was ruled out on ethical grounds by one medical research specialist. 'Altruistic living donation' was in the top four options, but ranked below the top performing options overall by citizens and specialists. It was again ruled out by one medical research specialist, and considered differently by the men's and women's citizens' panels (Burgess *et al.* 2007).

The two more technology-based common options, 'Xenotransplantation' and 'Embryonic stem cells', performed worst overall. These options either scored towards the bottom of the range of options, and/or were ruled out entirely by some of the specialists. 'Xenotransplantation' was scored unequivocally worst by all four citizens' panels and by the specialists overall (Burgess *et al.* 2007).

Burgess *et al.* note that the overall consistency seen in scoring is a significant finding in itself, particularly given the range of participant backgrounds, and since DM explicitly aims to explore diverse views. The approach taken in the case study was relatively costly, and was undertaken over a period of 21 months. The researchers acknowledge this will not always be possible for live policy issues and the full report does consider questions about 'scaling up' and/or 'scaling down' DM.

In Figures A6-A8, option performance ranges from low on the left to high on the right.

Key to options:

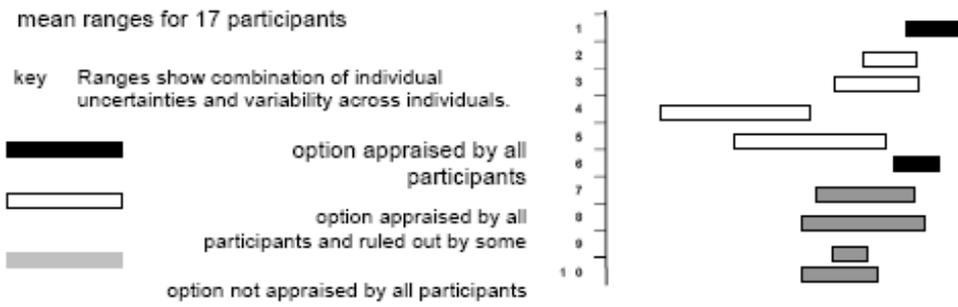
- | | |
|---------------------------------|---------------------------------|
| 1. Improved transplant services | 6. Encouraging healthier living |
| 2. Altruistic living donation | 7. Improved kidney machines |
| 3. Presumed consent | 8. Adult stem cells |
| 4. Xenotransplantation | 9. Rewarded giving |
| 5. Embryonic stem cells | 10. Accepting death |

Figure A6 Citizens' panel rankings



Source: Davies *et al.* (2003; 15)

Figure A7 Specialists' rankings



Source: Davies *et al.* (2003; 15)

Figure A8 Mean ranking ranges for sub-groups of specialists



Source: Davies *et al.* (2003; 16)