EXPLORING ALTERNATIVES FOR ENVIRONMENTAL VALUATION

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Clive L. Spash, Sigrid Stagl and Michael Getzner

Introduction

1.1

The method of inclusion of environmental resources and ecosystem services in decision processes determines how far they are taken into account with results affecting the quality of our lives and those of future generations. A persistent argument has been that monetary valuation is essential if the 'environment' is to have any chance of being included in government and business decisions. Environmental cost-benefit analysis (CBA) was developed by environmental economists in order to achieve this monetisation of environmental entities so that the prices in market economies might be adjusted. A range of methods were developed including travel cost, hedonic pricing, production function analysis, contingent valuation and choice modelling (see Hanley and Spash 1993; Spash and Carter 2002). The overall aim has been to select project options on the basis of their welfare impacts and to support government taxes which reflect the social costs of environmental degradation. This approach has met with some success in that various national and international agencies have been interested in performing monetary valuation exercises as part of their overall assessment of projects. The idea of environmental taxation has also risen on the political agenda if remaining limited in practice.[1]

However, there has also been criticism of environmental CBA, or more specifically some of the studies conducted under that guise. Critiques can be broadly grouped into those concerned with the theoretical foundations of economic values, and those looking at the validity of specific numbers being produced and the tools employed. In the former case Kapp (1950) provides an isolated early example which shows the limits to monetary as opposed to other values in society. More recently environmental philosophers have produced a whole body of literature showing the narrowness of value theory typically expressed by economists and the failure of economic training to place this theory in the context of wider social values (see O'Neill 1993). Reflecting upon this literature

requires realising that most economics concerns consequentialism using a form of preference-based utilitarianism, which is a very specific philosophy of value rather than a generally accepted meta ethic which can be universally applied. In trying to address the environmental problems of the 20th Century economic value theory has shown itself lacking in several areas such as the treatment of time, complexity, strong uncertainty, political systems, rights and social norms. The enhanced Greenhouse Effect raises all these issues and exposes the failures of discounting, partial equilibrium analysis, risk assessment and assuming that efficiency is the key social goal (Spash 2002).

The other area of critical analysis abstracts from the first set of problems and tends to be a debate on validity which has been largely internal to the economics profession (although implications of the value debate are also related via theoretical foundations). Validity concerns result in specific applications being criticised for their failure to respect microeconomic and welfare theoretic constraints. Those working within decision making government institutions, such as environmental protection agencies or the treasury, may see such theoretical restrictions as academic and going beyond what is required for practical policy making (for example see comments by Burney 2000). However once valuation becomes divorced from its theoretical roots numbers can be produced which have little content or meaning, and are defensible only in terms of their political role rather than theoretical basis. In this respect the popularisation of environmental CBA has been a problem as studies proliferate, numbers are transferred out of context and applications seek to meet policy desires. Excessive aggregation is exemplified by attempts to value regional, national and even the world's ecosystems, although what is meant by a trade price in these contexts is mystifying, and asking who might be the 'seller' and 'purchaser' exposes the fallacious use of economic value theory. Furthermore, the range of reasonable numbers stemming from monetization exercises is often very broad which facilitates the arbitrary use of valuation results.

The contingent valuation method (CVM) has become the most widely conducted CBA tool. The main advantage attracting this attention is the ability of CVM to estimate what are termed

option, 'existence' and bequest values in addition to direct use values. These are amounts reflecting: the preservation of an option to use a resource in the future, the maintained existence of a resource or entity regardless of personal use, and the desire to pass the resource to one's descendents. The sum of these indirect or passive use values can be large compared to the direct use values associated with non-market goods to which the other CBA methods are solely restricted. The popularity of the CVM is also based upon the apparent simplicity of asking members of the general public the maximum they are willing to pay (WTP) for an environmental improvement or, less commonly, the least they would be willing to accept (WTA) in compensation for environmental degradation. Considerable research energy has gone into refining CVM and related stated preference approaches. The result has been to increase the complexity and cost of conducting a CVM if it is to attain the highest standards of validity. In the United States of America this is the legally defensible standard which can cost millions of dollars for a nationally representative random sample including a range of pre-tests, focus groups and internal consistency and validity checks in the survey, as well as several variations on survey design.

The litigation surrounding the oil spill from the tanker Exxon Valdez led to a set of such standards being produce by a panel of experts commissioned by the National Oceanic and Atmospheric Administration (NOAA). This panel consisted of a number of famous economists, such as Nobel Prize winners Kenneth Arrow and Robert Solow. The panel was also asked to investigate the concept of 'existence' value. The panel's report gave a qualified support for the CVM (NOAA 1993). The panel stated that 'existence' values are a theoretically meaningful aspect of value. As regards the ability of the CVM to estimate such values, the panel noted five main problem areas: inconsistency of responses with economic models of rational choice; mental account bias, especially when respondents are inadequately informed as to substitutes; aggregating benefits; providing information; and warm glow effects. However, the panel felt that so long as certain guidelines were followed, CVM results could be judged as both meaningful and useful indicators of natural resource

damages. These guidelines are that (i) WTP should be used in preference to WTA; (ii) mail surveys should be avoided; (iii) respondents should be given full information on the resource change (including information on substitutes), and be asked how well they understand this information; (iv) open-ended responses should be rejected in favour of closed-ended referendum formats; (v) a random population sample is required; (vi) respondents should be reminded about the need to reduce expenditure on some item of their budget in order to be able to pay their stated bid; and (vii) careful pre-testing should be carried out.

Such rules tend to be excessively prescriptive and ignore the specific context in which a valuation exercise must take place. There are certainly general design features in any contingent valuation study which are desirable. These include clear description of the institutional context, explaining the consequences and expected benefits of payment, being aware of various biases which can be introduced in design, such as use of a contentious bid vehicle, and generally producing a realistic scenario. Without addressing such issues any research which claims to be relevant to the economic debate will be seen as inadequate and may also be misleading. However, employing rules which prevent hypothesis testing and experimental design is more worrisome. The NOAA Panel holds an implicit belief in a single universal standard of best practice which ignores cultural, legal and institutional variation. People trade differently in different countries (e.g. haggling vs. accepting the stated price), property rights vary (WTP vs. WTA), areas of trade which are taboo differ, and truly random sampling is difficult at best and impossible in industrially developing countries. A serious concern here is the extent to which research designs which fail to conform to the rules are branded as poor practice when they may be valid research aiming to question the underlying tenets of the model. Blind use of highly specific guidelines can remove the room for original research especially in the areas of economic psychology and human behaviour.

CBA, along with mainstream microeconomics, has been increasingly criticised for building upon an unsound theoretical base in terms of human behaviour and the CVM has made this even

more evident. That is, the microeconomic axioms of choice make assumptions which are at best inconsistent with theories of modern psychology and empirical evidence. In the valuation area Kahneman and Tversky's (1979) prospect theory revealed that people value gains and losses asymmetrically and this can explain the observed gap between WTP and WTA measures. Knetsch (Knetsch and Sinden 1984; 1994; 1995; 1999) has shown the frequent occurrence of behaviours which are inconsistent with accepted economic norms but commonly dismissed by economic models. The refusal to make trade-offs has been shown to arise in CVM studies both amongst those who protest against the use of monetary valuation of the environment and also those prepared to make a contribution (Spash 2000; Spash 2002; Spash 2002). The results can be linked to rights based beliefs which contrast with those of the economic utilitarian (Spash and Simpson 1994; Spash 2000). In terms of the economic model the only way in which such behaviour can be characterised is as lexicographic preferences which are deemed, at best, to be held only by a strange minority (Spash 1998; Spash 2000; Spash, van der Werff ten Bosch et al. 2000). A range of techniques is therefore required to understand human psychology in terms of the attitudes, ethical beliefs and social norms which motivate behavioural responses.

Concerns raised about the practice of attaching monetary values to all dimensions of socio-economic and biophysical systems have led to the call for alternative valuation methods (Martinez-Alier, Munda et al. 1998). There has been a powerful argument for shifting away from the sole focus on outcome towards the quality of decision process (Funtowicz and Ravetz 1990; O'Connor, Funtowicz et al. 1998). In particular multiple criteria assessment has become a more widely used method offering the potential for the integrated assessment of local, national and international policies and as means for combing different perspectives associated with sustainability goals. Sustainability raises a set of issues based on civil rights of current and future generations as well as respect for ecological systems. Understanding that biophysical as well as human systems are complex, and will never be fully understood, has led to the development of approaches which favour

adaptive behaviour and learning processes over optimal solutions. Closely linked to this view is the acknowledgement of uncertainty of future events and their impacts on human and non-human systems. All these factors redefine the role of experts, the meaning of knowledge and how decision process need to be designed to make more effective policy.

In the environmental policy arena, and elsewhere, there has been a push for greater public participation e.g. in Europe the Aarhus Convention (European Commission 1998) and the inclusion of non-governmental stakeholders in project appraisal. Researchers are meeting this challenge both through interdisciplinary discourse and also by contributing to the formation of novel democratic institutions. There is both innovation in traditional environmental CBA and in terms of new political institutions for addressing valuation issues. In the former case are the range of techniques termed deliberative monetary valuation (Spash 2001), and in the latter such tools as the citizens jury. Research into the operational criteria for effective public participation is at an early stage of development.

The search for validity in applying CBA methods has lead to a variety of appeals to interest groups and/or members of the public in an attempt to supplement the normal information content of prices placed on the environment. Thus, the travel cost method may be combined with an interview approach in order to sustain assumptions of how individuals behave, value time and relate to the environment. Hedonic pricing has sought corroboration from estate agent valuations as representing 'informed' preferences. Focus groups have been used in conjunction with the CVM to test survey design on the basis that group deliberation could validate the information content and help identify design biases. This last approach is most clearly where deliberative practices have begun to enter. For example, the largest CVM study in the UK was conducted on environmental impacts associated with aggregates (Department of the Environment Transport and the Regions 1999). The interesting feature of this work in the current context was the informal use of vested industrial interests (stakeholders) in the first part of the study and the use of public focus groups in the design stage of

the second. Although the feedback from the public proved problematic by diverging from economic assumptions (e.g. the expressed desire for community compensation unrelated to the individual), and neither process was formally reported.

Thus, two broad approaches to combining deliberation and monetary valuation can be identified. The first regards monetary valuation as basically sound but being able to benefit from supplementary, and often informal, processes borrowing elements of deliberation. The second sees the use of deliberative approaches as a new method allowing the (collective or individual) production of a monetary valuation for environmental goods and services. Under the first approach a variety of alternatives exist, and monetary valuation may be either followed or preceded by some element of deliberation. Stakeholder participation, as mentioned above, may be employed to validate outcomes. The implication being that ex post deliberations can be used in some way to adjust valuation results or their presentation. Deliberative processes and environmental valuation may also be sequential e.g. selecting a sub-sample of participants from a CVM survey for a citizens' jury on the same environmental issue. Ex-ante deliberation has been employed in designing CVM surveys with the use of focus groups to test the wording and respondents understanding of survey questions. Deliberation is then regarded as useful in providing insight into the processes by which respondents produce their WTA or WTP bid. This may be extended to allowing a deliberative process to determine the options or institutional context to be valued in the survey.

The second approach is what Spash (2001) has termed deliberative monetary valuation (DMV) as advocated by, for example, Brown et al (1995), Jacobs (1997), Ward (1999), Kenyon et al. (2001). DMV is the use of formal deliberation concerning an environmental impact in order to express value in monetary terms for policy purposes, and more specifically as an input to CBA. For example, consider a proposal to build a new road through a wilderness area and so destroy the habitat of a number of rare or threatened species. A group of citizens would be selected and meet to discuss information about these environmental damages associated with the development. Known

costs and benefits (discounted) would be presented, while those pertaining to environmental damages would be deliberated. The citizens would form a jury aiming to provide a monetary value for environmental damages which might be in terms of an individual WTA to allow the project to proceed. The result would then be incorporated into a net present value calculation to determine the viability of the project.

The meaning of such values remain contentious as they are mediated individual values. In order to address the increasingly evident fact that preferences are formed and there is a lack of arbitrage in valuing environmental goods and services economists are appealing to methods from political science. However, approaches such as citizens juries and contingent valuation, or more generally deliberative forums and monetary valuation differ in fundamental ways. This has been pointed out by Niemeyer and Spash (2001) as involving the approach taken to theoretical factors (individual and social ontology, preference basis, rationality theory), practical factors (justification, framing, value representation, institutional setting), and political factors (manipulation, representation, social impact). The variation between approaches to each of these factors means the very concept of DMV is brought into question. In simplified terms can DMV take the best of both monetary and deliberative methods as advocates hope or does it merely create a messy confusion as to the values being expressed?

Clearly research into valuation needs to span different disciplines such as social psychology, applied philosophy, political theory and economics. While interest in doing so seems to have increased the quality of the applications can be questionable (Spash 2000). Part of the problem is for economists to understand the requirements of other disciplines while practitioners in those other disciplines must similarly have a good practical knowledge of what economists are trying to do. Thus, applying attitudinal measures from social psychology may prove insightful with respect to WTP, but only if researchers also understand welfare economics and CBA tools so that their work

can address the economics literature. This is a challenging research agenda but one which, as several contributions in this volume show, is now being taken on at several different levels.

1.2 Contributions to the debate in this book

The book is organised around three major drivers influencing the field of environmental valuation, namely attempts at: understanding the results from environmental CBA and the foundations of economic behaviour, taking multiple values into account, and exploring the role for inclusive deliberation in valuation processes. The chapters reflect the debates over method development which are on-going in the valuation community. Clearly all methods have advantages and disadvantages and there is no pretence on the part of the editors that any one approach offers a panacea. What the reader will find is the presentation of a range of attempts to learn from different disciplines in order to achieve practical approaches which can improve our understanding and expression of environmental values.

Economic Values and the Psychology of Behaviour

Getzner opens the book by exploring epistemological and other theoretical problems in understanding economic values with a specific focus upon the CVM. What might be regarded as specific validity issues are addressed (i.e. hypothetical bias, framing of questions), but a different perspective is gained by placing these issues within the context of the social role respondents adopt when answering CVM surveys. The refusal to trade money for environmental change is raised as an important behaviour and related to the literature on lexicographic preferences (see for example Spash and Hanley 1995; Spash 1998; Spash, van der Werff ten Bosch et al. 2000). In addition, some of the literature on the supposed dichotomy of individuals as political citizens and economic consumers is discussed. This then provides the background to a range of variables for inclusion in bid curve analysis. The empirical test presented uses WTP for a nature preservation programme in Austria stated to be able to secure the survival of certain species and ecosystems. A convenience sample of 189 University students form the data base. The results on answers consistent with lexicographic

preferences are mixed. While 94 percent of respondents claimed species protection should be undertaken regardless of the cost only just over 7 percent rejected WTP questions because they regarded species could not be valued in monetary terms. This implies the need for careful probing of interviewees in order to understand their responses (Spash 2000). The explanatory power of the model is greatly enhanced by what can be regarded as non-economic variables or at least non-standard ones. These factors are interpreted by Getzner as showing the importance of social and institutional context. A strong influence of variables related to charitable giving is revealed, which supports claims by others that CVM is fails to measure a trade price as is assumed by practitioners (see Spash 2000). A clear implication of this type of work is the need to probe more deeply into the motives behind stated preference behaviour.

Meyerhoff follows-up on this challenge by focusing upon the importance of attitudes as explanatory motives for WTP to improve environmental quality. A key contention here has been the claim by some social psychologists that the results of CVM are merely poor measures of attitudes. One method of testing this hypothesis is to conduct bid curve analysis and probe which variables best explain WTP or WTA. Meyerhoff focuses on the difference between non-users and users with the expectation that non-users only express indirect or passive use values (sometimes erroneously termed non-use values) and that these are related to non-economic factors. Indeed Westra is cited as showing the relationship of such values to attitudes. Meyerhoff uses WTP for protection of the nature and landscape of the German Wadden, a coastal wetlands ecosystem, against threats from climate change. A total of 1412 semi-random interviews were conducted face to face. The data analysis proceeds by excluding "protest bids" which are zero bids for reasons regarded as inconsistent with placing a zero value on the environmental improvement e.g. protesting against the use of taxes to achieve this. The practice is highly questionable as Meyerhoff notes but he proceeds to use follow-up questions to exclude 56 per cent of the sample. How this may have affected the results is unclear. Among the remaining sample a higher WTP is found amongst those accepting

money as a measure of environmental value, although interestingly rejection of money as a measure does not mean all such respondents give a zero WTP. This is consistent with other findings where those rejecting an economic rationale for valuing the environment (e.g. rights based) have been found to have a positive WTP; although, in apparent contrast with the results here, WTP has also been found to be higher amongst such groups than amongst those favouring economic trade-off justifications for their WTP (Spash 2000). A key finding by Meyerhoff is that non-users' WTP is explained by attitudinal and economic variables while only attitudinal variables prove significant for the user group. This would seem to imply that users have a stronger non-economic value orientation. In discussing attitudes Meyerhoff notes the difference between measuring general attitudes which are related to ethical beliefs and basic values and those attitudes which are specific to a behaviour. The latter category and correspondence between the level of attitude framing and behaviour are recommended if attitudes are to be expected to predict behavioural intentions. His measures of attitudes towards Nature and climate change fall closer to the former category in terms of their generality i.e. they are related to but unspecific in terms of the WTP scenario being valued. The results show there are clearly strong statistical relationships between CVM results and underlying attitudes. What remains unclear is the extent to which these motives are driven by social norms and ethical beliefs and how far the type of environmental entities currently being subject to CVM surveys fall outside the economic realm of value.

Mosler is also concerned with the mix of economic and non-economic motives for human behaviour. He pursues a model of behaviour which includes social and personal factors which he differentiates from those which are purely economic. However, his emphasis is on how the psychology of the individual can be modelled to explain social decisions rather than narrowly defined values. The agent based social simulation model he develops is explained carefully along with a series of definitions and feedback loops which aim to characterise human resource use and environmental impacts. Amongst the factors included as explanatory of human behaviour are

attitudes, subjective norms, behavioural control, weighing costs and benefits, and sustainability motives (combining a value and norm orientation). The CBA component is regarded as encapsulating economic considerations via personal returns from a given action. The sustainability motive is strongest where an individual values the environment highly and the gap between actual and sustainable patterns of use are small (on the basis that a large gap is demotivating due to the difficulty of closing it). Mosler examines the conditions necessary for a collective reorientation towards environmentally sustainable behaviour. His simulation modelling shows the role which can be played by the environmentally friendly behaviour of some 'pioneer' individuals and how policy might be developed to increase the number of persons joining ranks with such pioneers. Sustainability requires such an increase to build its own momentum leading to a large-scale 'turn-around' of previous environmentally harmful patterns of behaviour. The aim of the simulation approach is to indicate means by which policy instruments, such as environmental campaigns, can be implemented most effectively. One aspect of the model is how people process information and whether they become engaged and find an argument persuasive. This has also been raised as an issue for CVM because central processing means deep evaluation while peripheral processing means being led by comparatively insignificant factors. Indeed, for example, ethical beliefs have been cited as such a peripheral factor (Ajzen, Brown et al. 1996), but empirical evidence shows those entering central processing mode tend to rely on their ethical beliefs as well as scientific information (Spash 2002). As Mosler notes there is scope for the interaction of simulation modelling and empirical studies which would seem essential for increasing understanding of complex systems.

Taking Multiple Values into Account

Multiple criteria analysis was initially developed for production planning and methods were also applied in the field of financial management. The field has since expanded dramatically and a great number of algorithms are now available for weighting, comparing and combining information. Since they were developed with different problems in mind, researchers and policy-makers in the

environmental field need some way to distinguish between the different algorithms. De Montis, De Toro, Droste, Omann and Stagl develop a framework for the comparison of MCA methods. They set out to identify a list of criteria referring to issues of particular relevance for the analysis of questions concerning sustainable development such as uncertainty, stakeholder involvement and non-substitutability between criteria. This framework is then employed to analyse and compare seven MCA methods frequently used for integrated assessment, namely: multiple attribute value theory (MAUT), analytic hierarchy process (AHP), evaluation matrix (Evamix), Electre III, Regime, Novel Approach to Imprecise Assessment and Decision Environments (NAIADE), and Multi-Objective-Programming (MOP)/Goal Programming (GP). The results highlight the types of issues for which the respective methods are most suitable as well as problems that cannot be addressed by any MCA method. Thus, MAUT requires adherence to welfare theory, NAIDE and AHP are useful where there are value conflicts, MAUT and AHP are useful as learning tools, where constraints are important Electre III and MOP/GP are best, the latter also serve to address case lacking discrete alternatives, and for ranking alternatives MAUT, AHP, Evamix and Regime are suitable. Each approach has its own context within which it can work best but the analyst is then responsible for selecting the most appropriate tool and justifying that choice.

When first developed, MCA methods were meant as tools for optimising production processes and for identifying Pareto optimal outcomes of planning tasks. Since identifying an optimal solution is impossible for problems in complex systems, MCA methods have more recently been combined with processes of public and/or vested interest (stakeholder) participation. This allows the analyst to gain legitimacy for the analysis but also adds to MCA the aspect of a learning tool, i.e. allowing participants to explore the values and qualities of the problem.

Proctor addresses the Comprehensive Regional Assessments of Australia's forests which aimed to ensure sustainable management. Planners faced the task of integrating different forest values in order to designated areas as reserves. Proctor uses a case study, outside the official

assessment, which shows how MCA can be applied to the problem. She makes use of official assessments, criteria and priorities placed on forest values by a stakeholder group which was involved in the assessment of the Southern Forest Region of New South Wales. Both the preferred option and the disparity/agreement between group members' evaluations are explored. Polarised opinions can thus be identified and discussions about compromises can be supported within the MCA framework. Proctor points also to new requirements for research processes of this kind, such as the need for a trained facilitator to aid interactive group decision-making. The outcome shows how values come to the fore in such processes. The two most favoured options reveal a choice which can be summarised as between environmental quality and employment. Sensitivity analysis can be used to show the robustness of the outcome and the failure of what might appear to be compromise options. This shows the way in which MCA can reveal value differences which inform policy.

Stirling and Mayer are also concerned by the approach governments take to form regulations and implement legislation. Their aim is to explicitly address issues of uncertainty related to the regulation of environmental and health risks. The chapter explains the need for a set of precautionary approaches, and as a consequence, reveals the problems associated with narrow risk assessment techniques based on rational choice and probability theory. Stirling and Mayer develop a set of criteria by which any "regulatory appraisal" (i.e., the way in which regulations are established) can be evaluated. The general approach is to select a single criteria for assessment and exclude much information relevant to, say, technological risks. Hence the criteria here concern the need for: greater humility, completeness, consideration of net benefits in different contexts, transparency, full engagement of interested and affected parties, mapping out different value judgements and framing assumptions, and allow for divergent views by considering diverse option mixes. These requirements might sound like something of a wish list which is itself hardly implementable but Stirling and Mayer then go on to show how such an appraisal can be performed.

An area of considerable conflict in the UK has been the genetic modification of agricultural crops. Stirling and Mayer use this as a case study to apply a novel approach which they call multi-criteria mapping (MCM). Twelve individual high profile protagonists in the GM food debate were selected as participants. These individuals came from a variety of backgrounds, including academics and government advisers, environmental, consumer and religious organisations and representatives from the farming, food and biotechnology industries. Results are reported on each individual and under the categories of 'academic', 'NGO', 'industry' and 'government'. Interviews were used to get each individual to add options, appraisal criteria, apply and scale the criteria against the options, and weight the criteria. In addition to the six 'basic options' a further 18 alternative agricultural strategies were identified; 117 appraisal criteria were defined by different participants. There are lessons for standard MCA as the authors state: "Participants adopt a variety of different 'framing assumptions', resulting in significant differences in the scores assigned by different participants under the same criteria. This has implications for conventional multi-criteria analysis, in which scoring is often conducted by a separate body of experts, with an assumption that different value judgements can be captured simply in the weightings." In addition, the information gained on vested interest is often surprising: for example, the biotechnology industry representatives underemphasised the social, environmental and safety considerations which are prominent under all other perspectives. The approach provides both specific information on the motives behind positions as well as allowing an overall appraisal of options. In the latter regard, the organic farming and integrated pest management options tend to perform significantly better overall.

Participation, Deliberation and Valuation

Aldred starts out with a comparison of the CVM with the CJ. The former is an individualistic preference based method while the latter is a community based form of social deliberation. The CVM and CJ answer to different institutional needs, cultural roles and social contexts and are based upon different explanations of rationality. This raises the question as to what extent they can in fact

be compared. Aldred argues that an assessment of which consultation process is superior for policy formation can be undertaken on the basis of considering the added value of discussion. He specifies the characteristics of the policy process in terms of open and closed inputs (or task set) and outputs (or expected result). The former is principally classified according to control while the latter according to agreement. The CVM has a closed input while the CJ is normally open but has the option of considering a closed input. Aldred argues that comparison requires he match the requirements so a CJ with closed input must be considered. In order to achieve the same for outputs he argues the complete decision process must be considered through to the final recommendation i.e. a full CBA compared to the CJ best option. However, he does allow that these requirements only apply for direct comparison and that indirect comparison can also be made, although that is not the aim in his chapter. Aldred draws a distinction between the role of discussion versus deliberation in decision processes and prefers to use the former term. So his aim is to compare closed forms of CVM and CJ on the basis that they differ in term of the latter adding discussion prior to an aggregative decision, and his aim is to judge whether the content of decisions is better with that discussion. He goes on to show that arguments by participants in a CJ must appeal to widely shared principles and he discredits the oft cited self-interested/selfish and strategic explanations for human behaviour in such contexts. He cites O'Neill (1993) on the Aristotelian view which encourages self awareness on behalf of listeners so they recognize their inability to evaluate certain claims and instead concentrate on assessing the character of the speaker. In general such an approach is applied when we judge a person's motivation, their trustworthiness and their good judgement. CJs are then seen as having the potential to allow listeners to assess the credibility of speakers as they share arguments. Having negated the criticisms arising mainly from a rational choice theory perspective, Aldred finishes by exploring the implications of imposing a closed output on a CJ and hence moves into the area of DMV (discussed earlier in this chapter), which claims to combine the advantages of discussion with the merits of a valuation output. The concerns raised here cover forcing a decision

on the CJ, losing trust of the jurors in the process, and whether quantitative or qualitative outputs are appropriate. In summary, where bounded rationality is likely to be severe, principles of public interest arise, or important private information is present CJ appears more attractive, and while both CJ and the CVM have problems Aldred does not see DMV as the solution. He does, however, appeal for "a careful, empirical, case-by-case comparison" to add to his abstract epistemic arguments.

Kenyon and Hanley are concerned with the empirical application and comparison of all three methods (CJ, CVM, DMV) to the Ettrick Forest Floodplain Restoration Project in Scotland. The arguments are firmly arsing from an economic model with, for example, CJs described as addressing "the information problem better than the CVM" i.e., addressing the fact that preferences are formed and not merely informed during a valuation process and any information set is never 'neutral' (see Spash 2002). The reason Kenyon and Hanley pursue DMV is because CJs "do not provide an economic estimate of the value of any particular project, nor whether it constitutes an efficient use of resources". For the CVM a stratified sample of nine towns in the Borders Region of Scotland resulted in 336 responses to the survey including the request for a charitable donation. Of these 29 per cent were classified as protest bids and removed from the data set and any further analysis. CJ participants were selected from the CVM questionnaire respondents. Kenyon and Hanley claim that the eleven jurors were selected "to be representative of the Borders population", although what they represent is left unspecified. The jurors were concerned that they might need to set up a trust fund to cover under-funding (as implied by the CVM) but "after speaking with a member of the local community" were reassured that the local community were fully involved in the project and the site would be well managed into the future. The CJ considered environmental and social elements important in judging the success of the project and in making management recommendations, but "that they did not seem to consider economic criteria important". Selection for the DMV was on the basis of responses to a letter sent to 500 households. Two workshops were carried out in each of two towns in the Borders, giving a total of four workshops and 44 participants. The DMV started by

administering the CVM, then took participants into small group (four to seven people) discussions on problems and management options, and finally asked them as individuals to answer some questions including whether they now wanted to revise their WTP and only 14 percent did so. DMV initial bids included 5 percent protest bids and 34 percent 'don't know' responses, and only two people moved from the latter after the discussion stage. An advantage of the DMV over the CVM was seen to be the information on positive and negative views of the project. When aggregated WTP figure was presented to DMV participants there were three responses: the impossibility of putting a value on such a project, the poor economic situation meaning the need to spend money elsewhere, and wanting some other public fund to pay. Overall the authors conclude in favour of DMV as a middle path.

James and Blamey concentrate on a DMV approach, which they describe as a CJ with the added task of determining societal WTP for a specified programme involving environmental improvement. They open by addressing problems and issues relating to the theory and application of both the CVM and deliberative approaches. This aims to show the potential of a DMV approach. The empirical case study is the management of national parks in New South Wales, Australia. As in the chapter by Kenyon and Hanley, there was a concern that the participants be representative and in this case the criteria are given (gender, age, place of residence, ranking of the environment in relation to other social issues, occupation, income, income source and education). Such representation is a little strange in these studies as the only aim can be statistical significance but the sample sizes are so small as to make this irrelevant (for elaboration on the difference between political and statistical representation see O'Neill 2001). There were thirteen participants (and one no show). The DMV panel was given three options developed by the researchers and a fourth developed by the researchers on the basis of answers given to a "straw preference poll" (although what this involved remain unclear). Participants were limited to considering only these options. This approach can be seen as Aldrid's closed input and closed output case making the DMV comparable (in those terms)

to the CVM. After individual consideration of three options the panel was convened and the choices discussed. The aim of the researchers seems to have been for a consensus report and the panel gave a preferred option with qualifications covering the concerns of those who were initially against that option. Next the valuation question was introduced as part of the fourth option. The task for the panel was to determine how high a park "levy" would have to be before the NSW public would be no better off than under the status quo. That is they were being asked to set the average annual WTP, rather than their own maximum WTP as in a CVM survey. Perhaps surprisingly, the panel was able to come up with two amounts and voted to decide which amount was to be recommended. The use of majority voting occurred at several stages in the discussions in order to close down dissent. In their conclusions the authors discuss a question which remains open, that is how to interpret the value obtained? The amount fails to relate to economic welfare theory and would seem hard to compare with other microeconomic welfare theoretic measures. At the same time the thirteen panellists cannot claim statistical representativeness which only leave them with stating a political position which might be done more directly. The authors also raise several other issues including consensus formation, decision rules for polling or voting, equality of juror impact, and provision of information.

Arzt picks up some of the same themes in addressing whether researchers should aim to reveal existing preferences or initiate and foster learning processes and thereby help form preferences. The contention is that environmental valuation is a subjective, cultural and contextual phenomenon. The approach for addressing policy needs here is to appeal to vested interest group representation in a framework termed an "interactive valuation process", where individuals, in groups, construct values rather than express prior preferences. This approach is equated to a roundtable and cited as deriving from Ostrom's (1998b) "second generation models of rationality for social dilemma situations" to understand when co-operation in small groups can take place. Much is made of the need to build trust over time through repeated meetings, although this would seem to

contrast significantly with the CJs used in other chapters of this volume. In this respect the motives for behaviour described by Arzt are worth comparing with those discussed by Aldrid. She also describes the roundtable as a consensus seeking exercise in which decisions are made without voting or other mechanisms, and this can be contrast with the way in which James and Blamey ran their DMV panel. In this roundtable consensus seeking some tools and techniques are advocated including MCA, visualisation techniques and professional moderation.

The case study concerned a roundtable run in the Uckermark, Brandenburg county, region of northeast Germany with the topic of decentralising decisions about agri-environmental measures. Agri-environmental schemes are already run from the local government level (as opposed to say those in the UK) but decisions on targets are made by experts without consultation with farmers or conservationists. A community meeting was used to select the roundtable with 43 people out of 100 attending the meeting and 23 volunteering. Six meetings were held on a monthly basis with varying participation rates. The interdisciplinary research team from different institutions found their own problems before even starting the roundtable: "The different backgrounds of the project team made it difficult to find a general understanding of the definition of 'value' and 'learning processes' beforehand. The team could not create a common understanding about the institutional arrangement…". The aim had been to cover a range of five issues in sequence covering: reasons for the problem and expected long-term consequences, solutions including justifications, measures to achieve these solutions including monitoring, financing and action planning. However, after three meetings, the main interest of stakeholder was still focussed on measures and their financing. One farmer is reported as stating: "I would do anything, if I got enough cash." Attempts to discuss scientific uncertainties over a specific type of water body (Sölle) management, at the third meeting, also failed as the farmers/land managers expected the expert scientists to tell them what was best to do. Only when the following (fourth) meeting followed a very structured approach to management of these water bodies was some headway achieved. The final two meetings switched to soil erosion.

The fifth meeting was dominated by a soil expert and the sixth, where only three farmers attended, by the agricultural administration. The difficulty of running this process compared to the high expectations of the theoretical literature raises a range of good lessons for research and practice. Power is an important element and affected representation with small farmers unwilling to attend knowing 'consensus' process in the past were dominated by large cooperatives, and women being a minority and silent. This has obvious parallels with the "willingness to say" problems as raised by O'Neill and discussed by Aldred, and this issue also arose directly with experts dominating some meetings. Representation problems also arose in a different form with one organisation alternating their representative but those tow individuals holding very different opinions. The need for greater structure in the process might be met by use of an MCA type of process such as the MCM approach developed by Stirling and Meyer. However, there also may be some cultural differences arising in this study (e.g., desire for structure and being told the best option, high esteem of scientists), so that how far the design features can be determined in any one country specific study becomes a relevant research question. Indeed more generally the extent to which the benefits of participation and deliberation can be regarded as universal remains unanswered.

Niemeyer show how we might begin to address this last point with respect to CJs. Political science advocates of CJs have seen them as deliberative forums in which people can find truths and transform themselves away from more mundane daily preoccupations. Whether CJs are a processes which can lead to the change of fundamental attitudes and preferences in relation to environmental policies is then a testable hypothesis. Niemeyer contends that preferences are shaped during deliberation by information, attitude and process. The chapter shows how to measure both changes to (rank ordered) preferences and the underlying subjectivity for those preferences (using Q method). The case study concerns a controversial 'road', the Bloomfield Track, constructed by politically influential developers through a rainforest, in north Queensland, Australia, against the protests of conservationists. The area was later, after a change of regional government, designated the Wet

Tropics World Heritage Area. What action should be taken with respect to the route remains a problem. Local and Aboriginal communities now use the track as a convenient means of communication while environmentalists regard it as a scar across a World Heritage site causing erosion and damge to forest and coastal reef ecosystems. A random-stratified sample of twelve people from the region, was given the task of considering management options for the Track over a four-day period. Attitude information was obtained by surveying participants at the outset of deliberations, at the midway point, and immediately after proceedings. The combined data for all three Q sorts by the jurors produced four distinct factors: Preservation, Optimism, Pragmatism and Symbolism. Factorial analysis revealed four preference options: Close Road, Stabilize, Bituminize and Status Quo. This approach allows analysis of motive and examples of correlations are Preservation with Close Road and Pragmatism with Status Quo. Preferences with regard to these options changed substantially during deliberation. Two jurors experienced a near complete reversal of their original orderings, and preferences among jurors converged, although they never reached consensus. Jurors were encouraged by the process to take a community perspective, rather that of individual self interest. By the end of deliberation road closure had become the most preferred option. As Niemeyer notes this CJ was a success in terms of the expectations from political theory but it is also only one example and others have had mixed results, as did Arzt in this volume. He concludes that the outcome of deliberative forums is highly sensitive to context and design, and a wider transformation of society towards deliberative democracy is required but that such intuitional designs can help with that transformation.

1.3 Drawing Out Some Lessons

There are significant gains to be made by further use of participatory approaches in environmental management but maintaining the interest, involvement and commitment of civil society may prove a major challenge. Enthusiasm on behalf of researchers for new approaches needs to be qualified by awareness of the difficulties in applying techniques in different contexts and their potential for both

failure and manipulation. At the same time consumer boycotts and support for non-violent direct action (e.g. anti-road demonstrations) do indicate public dissatisfaction with current institutions and a demand for greater say in policy, as opposed to an infrequent vote for a possible representative. The concern for the political legitimacy of government policy is particularly relevant in societies with low voter turn-out or where systems fail to represent minority parties. Both the UK and the USA, for example, have systems which increasingly seem inadequate as far as voters are concerned. This general problem takes on specific significance in the formation of environmental policy where the directly concerned political parties are small and lack representation via established institutions. Thus, for example, under the UK system, which has no proportional representation, a substantial minority of votes for the Green Party has in the past been unable to gain even one member in parliament. At the same time redressing the political imbalance through new institutions is no easy task.

In this volume contributors show the difficulty in getting politically weak groups to voice their opinions in forums which are hoping to empower them. Various features of representative democracy have been raised by O'Neill (2001). In particular, environmental policy brings to the fore the question of representation for the silent voices of non-humans and future generations. Another aspect of representation is how information is delivered through the interaction of science and policy. The role of expert and 'objective' scientific information to inform policy on uncertain and complex environmental problems has been brought into question on issues ranging from nuclear power to genetically modified crops. That there is a problem with the traditional approach to environmental policy processes is apparent from the greater attention given in recent years to a range of alternative institutional approaches (Royal Commission on Environmental Pollution 1998). However, while several techniques have been increasingly deployed they also have their own limitations. The use of focus groups in the UK was seen as providing some additional legitimacy for policy, although now such an approach often receives popular derision as a marketing technique

which has been overused. Consensus conferences have been employed in several European countries but consensus is itself a questionable goal when facing fundamental differences in perspective and values. There are problems with closing down a debate in an effort to achieve an artificially stable outcome described as consensus. Instead there is a need for mapping out the contours of the debate via an approach such as suggested by Stirling and Meyer in this volume.

The use of "stakeholders" to represent vested interests directly in decision-process has entered into both policy and research with the emphasis on addressing the needs of "end-users". Both citizens' juries and the appeal to vested interests raise similar questions as to who should be represented and how they should be represented. Citizens juries have become more common as well as being an increasing focus of research. Some environmental economists have also become increasingly concerned to employ such approaches to increase the legitimacy of their valuation work.

The rise of DMV is a significant development as an indicator of the desire for greater legitimacy for the values being derived in economic assessments. The reasons driving this move are recognised inadequacies in the economic model of human behaviour. There is now far greater acceptance by economists that psychological motives are important and preferences are often constructed in response to research aiming to discover how people value the environment. The problem which then arises is how far the values being derived from DMV remain valid having been removed from their theoretical basis in economic welfare theory. If values as being derived by Blamey and James are to be given weight in decision processes there is a need for a new theoretical underpinning. At the same time social psychology raises many insights which economist are only just beginning to discover. The work on CVM has exposed problems with standard approaches and data interpretation. Yet there is still a surprising readiness amongst researchers to throw away large parts of their samples for analytical and/or practical convenience. There are two examples in the

current volume where protest bids are excluded removing 29 percent of the sample in one case and 56 percent of the sample in another.

Rather than excluding such information researchers need to investigate and understand what individuals are telling them. Perhaps the technique is failing but with CVM what seems to be happening is the economic model is being revealed as only a limited frame in which humans are prepared to operate. Some of the people may be homo œconomicus all of the time, all of the people may be homo œconomicus some of the time, but all of the people are never homo œconomicus all of the time. In environmental valuation rejection of the economic motive for behaviour is common and this cannot be disregarded purely on pragmatic grounds.

In the past the counter to critiques of CBA has often been that 'there is no option' and that 'because society uses a money metric so must environmentalists'. The treasury departments of government are certainly often the strongest and lie behind many decisions, but there are also other branches of government and civil society and different forums in which decision processes operate. This volume shows there are alternatives and these can be most rewarding in terms of gaining insight into value conflicts, while aiding and improving policy. There is a need to evaluate the opinions of experts as one perspective on the implications of any project and set their role within a broader social context where a range of motives operate and different values are expressed with equal legitimacy. However, there is no pretence that alternatives to traditional environmental valuation lack their own problems and can be difficult to implement successfully. Clearly more work is required which breaks down the boundaries between disciplines and more researchers are required who are prepared to venture out of the comfort zones of mono-disciplinarity into the challenging areas of interdisciplinarity. Ecological economics is one such attempt at bringing together diverse perspectives and approaches.

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1.4

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Endnotes

1.5

Revenue raising is a key objective of taxation rather than designing environmentally efficient and effective taxes. This means taxes which may be described as environmental in fact fail to address the pollution problem to which they are supposedly related. For example, a tax justified as reducing the Greenhouse Effect may select carbon dioxide emissions regardless of the other gases needing control and the tax may then relate only to industrial emissions from point sources ignoring a whole range of non-point, household and public sources or select only one specific fuel. Such decisions are taken on the basis of ease of administration and revenue raising potential rather than their economic efficiency at controlling pollution and matching marginal social costs of environmental use.