

Economic and Participatory Approaches to Environmental Evaluation

Wendy Kenyon¹ and Nick Hanley²

¹Scottish Agricultural College, West Mains Road, Edinburgh, Scotland, EH9 3JG.

Tel: 0131 535 4312

Fax: 0131 667 2601

Email: w.kenyon@ed.sac.ac.uk (Corresponding author)

²Institute of Ecology and Resource Management, The University of Edinburgh, West Mains Road, Edinburgh, EH9 3JG

Abstract

Economic and participatory methods of project appraisal have traditionally been viewed as mutually exclusive alternatives, as they address different decision making criteria. Participatory methods such as citizens' juries (or value juries) have been suggested as a means of better coping with some of the problems associated with economic evaluation methods such as contingent valuation. However, participatory methods have not offered the quantitative outputs of economic methods, nor have they addressed the issue of efficiency in resource allocation. In this paper we compare results from the use of contingent valuation and citizens' juries to appraise a woodland restoration project in Southern Scotland. We also investigate the potential of a third alternative which seeks to combine the strengths of contingent valuation and citizens' juries, the valuation workshop.

I. Introduction

Given the extensive literature documenting problems related to economic valuation techniques such as contingent valuation (CV), interest has developed in approaches which provide an alternative source of information on public value judgements for natural resource decision making (Brown et al, 1995). In particular, some authors have suggested that deliberative methods might have a role to play as alternatives or complements to more traditional project appraisal techniques (Jacobs, 1997; Sagoff, 1998). A number researchers have assessed the role of one such technique, the Citizen' Jury (CJ), which consists of a small group of people, selected to represent the general public rather than any particular interest group or sector, who meet to deliberate upon a policy question (Stewart, 1994; Aldred et al, 1997; James and Blamey; 1999).

The CJ offers a number of advantages over economic appraisal methods, and in particular over CV. First, respondents to CV surveys must understand exactly what it is they are to value if useful information about preferences is to be elicited (Arrow et al, 1992). However, recent literature highlights the fact that many respondents do not appear to be well informed about the issues or the good to be valued (Brown et al, 1995; Jacobs, 1997). As Munro and Hanley (1999) show, changing people's information sets can be expected to change their willingness to pay. CJs tackle this ignorance problem by combining information, time, scrutiny and deliberation in the preference elicitation process (Coote and Lenaghan, 1997). They allow participants to question witnesses, discuss witnesses' evidence with other Jurors, and thereby gradually learn about and reach a richer understanding of the issue (Sagoff, 1998). CJs therefore address the information problem better than CV.

Second, economists and others have suggested that a CV questionnaire asks respondents the wrong question, assuming that consumers think about environmental goods in the same way

they do about private goods (Blamey, 1996; Jacobs, 1997; Sagoff, 1988). Blamey (1996) suggests that respondents should not be treated as consumers of environmental goods, but rather as citizens who think of the welfare of the community when responding to environmental issues. In other words, individuals approach decision-making relating to environmental goods as citizens rather than consumers. Whilst the validity of this as a universal description fitting all cases of environmental management can be disputed, the use of CJs as a method of preference revelation allows consumers to be asked what Sagoff and Jacobs call “the right question”, as it allows deliberation on the environmental issue in terms of what is best for society. Indeed, while the question for the jury *can* be framed in the context of individual consumer values and preferences if necessary, CJs were developed specifically to determine opinions that represent the general public, rather than any individual interest (Coote and Lenaghan, 1997; Brown et al, 1995).

Third, CJ’s may also be useful in dealing with the equity and distributional issues which CV has attracted criticism over. Economic value is effectively determined by preferences, underpinned by ability to pay. Therefore, in CV, any value that a consumer places upon a good is not registered unless she is able to pay for it. CJs however allow participants’ opinions and preferences to be expressed and registered regardless of their ability to pay (Crosby, 1995).

Fourth, the United Nations Conference on Environment and Development has suggested that environmental decisions will not be sustainable unless local communities participate fully in the decision making process (United Nations, 1993). CV does not include the participation of the community in a central way, and therefore may not encourage sustainable actions. The use of CJs is in contrast a means by which public participation can be more fully incorporated into the environmental decision making process.

Finally, the notion of value construction suggests that respondents do not have well-defined preferences for many complex environmental goods prior to the elicitation process, but that these preferences are constructed during this elicitation process itself (Gregory et al, 1995; Payne et al, 1999). The way in which people construct their preferences is important as it is argued that decision makers should attach more weight to the preferences of someone who knows both sides of the argument, than to someone who's knowledge of the problem is more limited (Elster, 1983; Payne et al, 1999). According to Elster (1983) however, methods which explicitly try to determine how people construct their preferences (for example by aiding value construction, such as Gregory et al's (1997) decision pathways) are likely to be contradictory – akin to telling someone to “be spontaneous”! CJs, however, provide information about the process of preference construction as a by-product of the process rather than as a central role. Therefore, using CJs may offer a means of circumventing the contradiction inherent in helping respondents construct their values, and provide information to decision makers on the weight which should be given to those preferences expressed.

Elster (1983) argues that it is because CV is based on a “thin theory of rationality” which requires only consistency in the expression of preferences, that poor policy choices may be made on the basis of CV results. CJs on the other hand appear more consistent with a “broad theory of rationality” which examines not only the consistency of expressed preferences, but also the beliefs and desires behind decisions. He argues that decisions should be made by the “public and rational discussion about the common good, not the isolated act of voting to private preferences” (p35). CJs facilitate this type of rational discussion more so than the use of economic appraisal methods.

Despite the advantages that CJs appear to have over CV, CJ's do not provided an economic estimate of the value of any particular project, nor whether it constitutes an efficient use of

resources. These are important weaknesses. A third approach therefore seems potentially desirable, which allows deliberation, but also the estimation of the economic value of the total economic value of a project. Such a method might aim to combine the strengths of the CV and CJ. The paper reports on an application of three approaches to one decision making context, a proposed floodplain restoration project in the South of Scotland. A Contingent Valuation, a Citizens' Jury and a combined approach (the "Valuation Workshop") were conducted to assess the value of the project to local communities. The Valuation Workshop was an attempt to combine the quantitative outputs of CV with the participatory, deliberative and preference construction attributes of the CJ.

The rest of the paper is organised as follows. Section 2 briefly describes the context of the three approaches. Sections 3 and 4 report on the design and the results of the CV. Sections 5 and 6 describe the design and results of the Citizens' Jury, and sections 7 and 8 relate to the hybrid approach, the workshop approach. Section 9 assesses the methods, and looks at the implications of the Citizens' Jury and Valuation Workshop for dealing with problems related to CV. The paper concludes with a discussion of the complementarity of the three approaches.

II. The Ettrick Valley Floodplain Restoration Project

The context for implementation of the three techniques is a proposed Forest Floodplain Restoration Project in the Ettrick Valley in the Scottish Borders Region. In 1995, World Wide Fund for Nature Scotland responded to concerns about the loss of floodplain forest habitats in Scotland by commissioning a review of their status. One of the most ecologically interesting areas of floodplain identified in the review was the Upper Ettrick site, which contains a variety of woodland, wetland and grassland habitats of nature conservation interest. The different habitats are distributed in a mosaic of small patches which results in high biodiversity for the area, including species which are recognised as locally and nationally scarce or endangered.

The Upper Ettrick presents great potential for the expansion of this valuable habitat, utilising areas which are at present of limited conservation interest such as conifer plantation and improved grassland. Increasing the areas of valuable habitat would both protect the species which are already present and encourage others which would have been present in these habitats in the past.

A group of non-government and government organisations in partnership with the local community and landowners co-ordinated the habitat restoration project. The project was led by a local community organisation, the Borders Forest Trust (BFT), who were guided by technical and local community steering groups. The BFT were keen to work in partnership with the local community in all aspects of the project, including its evaluation, and were also keen to illustrate the economic benefit the project provided to current and potential future funders. The project therefore provided an appropriate context for the application of the three methods.

III. Design and Implementation of the Contingent Valuation Survey

There is much debate in the literature about the appropriate design of CV questionnaires, with respect to a number of issues, and in particular the choice of elicitation format and payment vehicle. Boyle and Bergstrom (1999) state that “despite early evidence that payment vehicles can influence responses to CV questions no published research has been conducted to address this concern” (p197). However, recent recommendations suggest that a mechanism where the respondent has no choice but to pay (e.g. taxation), is most appropriate. Carson et al (1999) suggests that the use of charitable donations as a payment vehicle within a CV survey may lead to strategic behaviour by the respondent. However, others suggest that a charitable bid vehicle is appropriate in certain circumstances, and indeed recommend that the information and questionnaire be in a campaigning style to imitate real scenarios of this nature (Macmillan et al, 1998). Macmillan et al (1998) found that a charitable donation achieved a high level of convergence with real payments. One of the other important design issues in CV surrounds the

elicitation format used. The National Oceanic and Atmospheric Administration panel favoured the dichotomous choice (DC) format, but this contrasts with other recommendations that the most conservative questionnaire design is most appropriate (Arrow et al, 1992). The DC format consistently produces higher estimates of mean WTP than do open ended elicitation formats (Ready et al, 1996; Boyle et al, 1996), and is therefore not the most conservative design choice.

Notwithstanding the preceding discussion, one of the most important considerations in the design of a CV questionnaire is to make the scenario believable (Mitchell and Carson, 1989; Boyle and Bergstrom, 1999). In the Etrick study a charitable donation payment vehicle and an open ended elicitation format were used. There were two main reasons for this choice. First, a number of focus groups were carried out during the design of the questionnaire, where different payment vehicles and elicitation formats were considered. Participants of these groups indicated that they were most comfortable with the open-ended format and the charitable donation bid vehicle. Secondly, this format and vehicle is one which respondents to the survey are familiar with, especially given the local nature of the project. A wildwood recreation project in the Borders Region of Scotland was campaigning for funds at a similar time that the questionnaire was designed, tested and conducted. In this real situation an open bid in conjunction with a payment card type elicitation method was used with a charitable donation as the payment mechanism. Respondents to the Etrick survey could therefore be expected to be familiar with this payment context, making the choice most suitable in the circumstances.

The questionnaire consisted of three sections. The first requested general information about respondent's residential status, their participation in outdoor activities, and attitudes towards the environment. The second provided information about the forest floodplain project and asked a payment principle question, as well as the willingness to pay question. This section

also reminded the respondent of their budget constraint, that the money would go to fund the Etrick project only, and that the project would not go ahead if sufficient funds were not raised from public donation. It also contained a question which allowed protest bids to be identified. The final section of the questionnaire requested the usual socio-economic data from respondents.

The questionnaires were completed in the late summer of 1998, by an independent market research company, using a face to face interview method. Nine towns in the Borders Region of Scotland were selected as sites for the questionnaires to be carried out, and responses were collected from a stratified sample of the Borders population, and a small number of visitors to the Region.

IV. Results of the Contingent Valuation Survey

The contingent valuation questionnaire provided information on respondents' willingness to pay for the project and on their views on the project as a whole. Of the 336 respondents, 29% were protest bids. This number is relatively high. Those respondents who did not provide a reason for bidding zero were classified as protesters, and table 1 shows the results of a probit regression on the protest decision. The log of income is significant and negative, so that as income increases the probability of protesting falls. Age also appears to be influential, with older respondents being more likely to protest. Participating in outdoor activities also has a significant impact on the protest decision, which may indicate that these respondents saw the use of the environment as a free good, and not something that they should have to pay for. Most significant of all variables influencing the protest bid were those respondents who indicated a preference for deciduous woodland over other habitats on the Etrick site. This may be related to an ethical stance or that respondents were aware of public funds available for such projects (this was a common observation made in the focus groups). Finally, if a respondent is

less likely to visit the site, she is more likely to protest, indicating that if they are not likely to use the site, respondents do not feel they should be asked to pay for it.

Table 1

Protest bids were removed from the data set for further analysis, and Table 2 shows the resultant descriptive statistics for the project. The mean willingness to pay was £13.18 per person for the project as a one off payment. As is common in such circumstances there were a large number (59%) of genuine zero bids (Mourato and Pearce, 1999; Macmillan et al, 1998; Alvarez-Farizo et al, 1999).

Table 2

Determinants of willingness to pay were therefore estimated using a Heckman procedure. The Heckman selection model assumes that the same variables may influence two decisions that the respondent makes: first on the probability of making a positive bid, and second, on the amount the respondent bids if the bid is positive. The model assumes at least one variable driving the decision to participate in the contingent market is different to the variables which drive the decision about how much to pay. The participation model estimated as a probit shows those factors that influence the decision of whether to make a zero bid or not. The payment model focuses on the variables which influence the decision about how much the respondent will bid, given that she bids a positive sum. These two models are estimated simultaneously and table 3 shows the results of this analysis. A number of variables affect the decision to make a positive or zero bid. Education is significant and positive, so that a respondent with a higher level of education is more likely to make a positive bid. However, two variables prove to be highly significant. First, the whether the respondent is likely to visit the area if the project went ahead.

Those who were more likely to visit were less likely to make a zero bid. Second, whether they prefer the site with the project. Those who prefer the site with the project are more likely to make a positive bid. Interestingly, income does not appear to be influential in this payment principle decision, nor in the decision on how much to pay if they are to make a non-zero bid. The only significant variable in how much the respondent bids given that she makes a positive bid is how many times the site was visited in the last year. This seems to indicate a willingness to pay for use of the area, rather than donation for potential non-use values. The inverse Mills ratio (the coefficient of λ) indicates however that the sample selection specification is not statistically significant here. (Mourato and Pearce, 1999).

Table 3

Given the results shown in table 2, the benefit of the project can be estimated at £568,677 (once only WTP aggregated over the population of the Borders Region) and can be compared with the costs of the project at £350,000ⁱ. Costs of the project were considered in the initial years only, as the aim of the project was that it would be self-sustaining, perhaps with some small continued help from the local community. The project does pass the cost benefit test, and may therefore be considered value for money. However, this data does not provide any recommendations for management, nor does the evaluation involve the participation of the local community in a central way. An alternative approach which does meet these two criteria was therefore also conducted – a Citizens’ Jury.

V. Design and Implementation of the Citizens Jury

The second approach taken to evaluate Ettrick Floodplain Restoration project was the Citizens’ Jury (CJ). The Jury participants were selected from the CV questionnaire respondents. The final question on the CV questionnaire asked respondents whether they would be willing to

attend a group meeting to discuss local issues in more depth. Those who responded positively to this question formed the pool from which jurors were selectedⁱⁱ. The CV questionnaire provided extensive socio-economic information about respondents, so that it was possible to select jurors to be representative of the Borders population. Eleven jurors finally took part in the Citizens' Jury.

The Jury met over three days and one evening in December 1998. The aim was to assess the project site and to provide qualitative information on its value and importance to the local community. The Jury was carried out in collaboration with a local community environmental organisation, the Borders Forest Trust, who were keen to encourage consultation and participation of the local community in the project. The jurors were asked to deliberate on the following specific questions: (i) What should individual land use and environmental projects in Southern Scotland such as the Etrick Forest Floodplain Project aim to achieve? and (ii) How might the success of such projects be determined? Clearly, "economic efficiency" could be one answer to either of these questions, but may not be a priority for participants.

To provide information with which the Jury could assess the project, ten witnesses attended sessions to provide 'evidence' and to answer questions. The witnesses were selected in consultation with the Borders Forest Trust, and in discussions with stakeholders from all sides of the debate to ensure balanced representation. The witnesses came from a variety of backgrounds including Scottish Natural Heritage, the local council, the Forestry Commission, the Scottish Tourist Board, and environmental consultants. Witnesses made short presentations to the Jury of 10 to 15 minutes followed by a discussion session with the Jury of about 30 to 40 minutes. In addition to sessions involving witnesses, the process included a number of Jury only sessions, where the jurors discussed particular issues as a whole unit, or in smaller groups using participatory appraisal techniques (Pretty, 1995). The final

recommendations were achieved entirely by discussion and consensus, and approved by all of the jurors. A report on the process and outcome of the Jury was written and sent to the jurors for approval, before being sent to the Borders Forest Trust and other interested parties (Kenyon, 1999).

VI. Results of the Citizens' Jury

The Jury made recommendations about how the Ettrick Project should be managed and coordinated in order to achieve the environmental and social objectives which the jurors felt were desirable in Southern Scotland. The jury also noted a number of aspects related to the project they felt were valuable (Table 4). Interestingly, not only environmental issues were identified, but also aspects which might be classed as social values, such as community involvement, and the role of the project for education.

Table 4

In addition to the aspects of value identified in table 4, the jury noted two areas of concern, namely access and future management. Jurors felt that visitors should be allowed access to the site, but were concerned about the damage they might inflict. Specific recommendations were made regarding arrangements to promote benign access, and the provision of information to visitors to encourage careful use of the site. The second area of concern related to future management of the site and the availability of funding to secure it. The Jurors felt that it may be possible to start a trust fund dedicated to the Ettrick to make sure that money was still available for future management. However, after speaking with a member of the local community, the jurors became less concerned as they were assured that the local community

were fully involved in the project that and they would ensure that the site was well managed into the future.

The Jury were able to look at the Ettrick project in the wider context of the South of Scotland, and made a number of recommendations regarding the management of individual environmental projects in the region. They felt that a variety of projects were needed in the region, which met a number of different needs, but that all of these projects should be co-ordinated in an integrated way. For example, some environmental projects might aim to attract tourism to the area, but such projects must be situated in less environmentally sensitive areas. Others might aim to increase biodiversity, but not aim to attract tourists. Finally, the Jury considered how the success of environmental projects such as the Ettrick Forest Floodplain Project, might be assessed. Table 5 shows the criteria offered by the Jury, who also suggested that these measures could be considered as element of future project design and planning. It is interesting to note that the jury considered environmental *and* social elements important in judging the success of the project, but that they did not seem to consider economic criteria important.

Table 5

VII. Design and Implementation of the Valuation Workshop

The final approach used to evaluate the Ettrick Floodplain Restoration Project was a hybrid of the CV and CJ, named the valuation workshop. It aimed to build on the strengths of the CV and CJ exercises, and contained elements of each. In particular, the intention was to combine the quantitative outputs of CV with the participatory, deliberative and preference construction aspects of the CJ. The valuation workshop was conducted in three parts. After an introduction, the participants were each given a contingent valuation questionnaire and asked to complete it individually. Next, participants were divided into groups of between 4 and 7 people for

discussion. The first task each group was given was to discuss the good aspects of the Ettrick project. Participatory methods were used to facilitate the discussion, and provide a focus for the task (Pretty et al, 1995). Each group was asked to provide a ranked list of good points related to the Ettrick project. The second task was to consider the problems of the project, and the concerns they had with it. Each group were asked to discuss problems, rank their relative importance and offer suggestion of how each problem might be mitigated or solved. The final task in this section of the workshop asked the participants to make recommendations on how the success of the project might be judged. This involved creating a list of means by which the project could be assessed, with discussion surrounding each suggestion. In the third part of the valuation workshop participants were asked to complete some further questions individually in a survey. These questions asked whether the participants would change the WTP they stated at the beginning of the workshop, and explain why. Participants had now had a chance to discuss the project, assimilate information more fully and consider the project from different perspectives, given the interaction with other participants.

The valuation workshops were conducted in December 1999. Two workshops were carried out in each of two towns in the Borders, giving a total of four workshops and 44 participants. In order to select participants 500 letters were sent out to a random selection of addresses in or near each of the towns. The letter invited the addressee to one of the workshops, explained that Scottish Agricultural College were carrying out research on the local environment and were interested in their views, and asked them to return an enclosed form if they wished to participate. A pool of possible participants was then drawn up from those who replied, and participants were chosen from this pool to be as representative of the local population as possible. Each participant was paid £20 for their attendance.

VIII. Results of the Valuation Workshop

The workshop provided a range of qualitative and quantitative data on the Ettrick project. Of the 44 participants attending the workshops 27 (61%) made genuine CV bids initially, the rest being either protest bids (5%) or “don’t know” responses (34%) to the valuation question. After the discussion, in the second part of the questionnaire, the number of valid bids increased as 2 of the “don’t know” respondents offered a new valid bid. Of the 44 participants only 6 (14%) changed their bid after the discussion (Table 6). Participants were clearly considering their budget constraints carefully as the most common reason given for not changing their bid was that their financial circumstances had not changed and they could not therefore afford a higher amount even if they now wanted to. Interestingly none of the participants revised their bid downwards. Although the preceding part of the workshop comprised discussion of both the good and bad aspects of the project, the discussion of the good points clearly carried more weight.

Table 6

Table 7a and 7b display the descriptive statistics for pre-discussion and post discussion bids. Although the mean has increased, a two tailed paired T-test showed no significant difference between the two workshop mean WTPs at 10% significance ($t = -0.57$, $p = 0.57$)ⁱⁱⁱ. Although the discussion did have an impact on individual bids, it did not therefore have a statistically significant impact on mean WTP. A Mann-Whitney U test gives the same results, the hypothesis that the pre-discussion median is equal to the post-discussion median cannot be rejected ($W = 747.0$, $p = 0.6735$ [adjusted for ties]).

Table 7a and 7b

In addition to this quantitative output, the valuation workshop provided information about what the participants felt was good and bad about the project, and how the project's success might be measured. Environmental aspects of the project were in all but one case considered the most important. The one group who dissented felt that the promotion of education and tourism in the area was most important. Table 8 shows the results from one discussion group which is typical of the responses from other groups.

Table 8

One strength of the valuation workshop approach relative to CV is that it provides additional information on areas of concern, and does not focus solely on positive aspects of the project. Participants were asked not only to discuss issues which they thought were problematic, but also to offer solutions to these problems. Table 9 shows the typical concerns and the solutions offered by one of the workshop groups. Every group considered the cost of the project to be a problem and many groups differentiated between start up costs and running costs. One of the other most discussed problems was that of access. Roads to the site were single track and not suitable for a large number of cars, and there was virtually no public transport available to the site. Despite having been provided with very little information participants were able to offer solutions to these problems in most cases, clearly some more practical than others (Table 9).

Table 9

Finally, the participants were asked to suggest how the success of the project might be measured. A range of ideas were suggested including monitoring flora and fauna, evaluating visitor levels, the level of community involvement, and interest in the site by educational establishments. As with the CJ, no economic criteria were suggested here.

IX. Discussion

Both the CV and the CJ methods provide policy relevant information, the information provided by each being useful in different ways. The results of the CJ identify the project needs and how it should develop. Table 4 lists those issues that the jurors felt to be positive, and that might be used as objectives by the managers of the project. Similarly, by identifying concerns relating to the project, jurors provide direction to managers and policymakers as to the development of the project. The information provided by the jury therefore plays a practical role in directing the management of the project.

The results of the CV method provided different, but equally policy relevant information. CV is able to measure both the intensity and direction of preferences, and provides data that is consistent with welfare economic analysis which can feed into cost benefit analysis. The benefit of the project estimated at £568,677 could be compared with the costs of the project at £350,000. The project passes the cost benefit test, and thus offers a potential Pareto improvement.

The workshop approach is an attempt to amalgamate aspects of the two methods and provide both practical guidelines to the project managers and cost benefit estimates, whilst maintaining the participation of the local community in the project evaluation. The results of the workshop are comparable on the one hand with the CV results and on the other with CJ results. A T-test shows that neither the pre-discussion workshop mean nor the post-discussion workshop mean WTP are significantly different from the CV mean bid at 10% level ($t = -0.41$, $p = 0.68$ and $t = 0.01$, $p = 0.99$ respectively). However, a Mann-Whitney U test does show a significant difference between the medians ($W = 4228.5$, $p = 0.0350$ and $W = 4265.5$, $p = 0.0268$ respectively).

The results of the discussion of the workshop correspond quite closely to the recommendations provided by the Jurors.

Workshop participants were also asked to evaluate the final aggregate CV result at the end of the session. The calculation was explained to the group, and the final figure presented to them. The comments from all the groups can be split into three categories. First, that it is not possible to put a value on such a project. Second, comments surrounded whether or not this aggregate figure would be obtained in reality, as due to the poor economic situation in the Borders there were more important things to spend money on. Third, the clear feeling that money for such projects should come from government, lottery or EU funds was expressed. Finally, there was discussion that information on costs (which was not made available) was required before any pronouncement was made on its value. This additional feature provides interesting information on the CV figures, and on the authenticity of the economic estimates.

Overall the valuation workshop approach goes some way to developing a method which provides economic estimates of environmental projects whilst adding value to traditional CV exercises, and offering qualitative recommendations. However, the workshop results suffer in this study from a small sample size relative to the CV survey.

In addition to highlighting the role of the results provided by each method, the research also sheds light on some of the concerns related to CV from the literature, and the role that more deliberative methods may have in mitigating these concerns. One relates to the provision of information to CV respondents. The respondents to the CV were given visual and verbal information about the project site, and asked, "Do you prefer the site with or without the project?" 13% of respondents did not know whether they preferred it with or without. This may indicate that the information was not sufficient for them to be able to determine their

preference. This did not appear to be a problem in the CJ. Jurors were all able to determine their own preferences regarding the Ettrick, and further were able to identify those aspects they preferred most (Table 4). The workshop participants were given the same information as the CV respondents, but were allowed to discuss it in a social setting. The fact that two participants changed their WTP bid from a “don’t know” response to a positive response implies that the discussion did allow the participants to better understand the project they were asked to pay for.

Secondly, a number of researchers suggest that CV questionnaires ask the wrong question and assume that respondents act as consumers and not citizens when responding. Our results indicate that this assumption may be valid (Sagoff 1998; Blamey, 1996). Table 2 shows that the most significant variable in influencing whether a respondent would be willing to pay anything is whether she was likely to visit the site if the project went ahead. This may indicate, that the respondents acted as consumers and not citizens when responding to the questionnaire. If this is the case, the CJ can be seen as a complement to the CV by evaluating the project from a citizens’ point of view. The valuation workshop incorporates elements of both a citizen and consumer approach. The initial CV responses were from a consumer standpoint, but the output from the discussion was clearly from a citizen standpoint, as the responses show, since community issues were considered an important aspect of the Ettrick project.

The issue of value construction is also a matter of debate within the environmental valuation literature. The CV results provide no evidence regarding the detailed construction of final values. However, comments from jury participants in the evaluation discussion and questionnaire at the end of the process suggested that breaking down the decision making process into tasks made the whole task less daunting, and more manageable. The by-product of these tasks is to provide information that may indicate how Jurors constructed their final

response. The evidence of the valuation workshop is mixed on this point. Whilst the pre discussion WTP was constructed in the normal CV way, the post discussion response had the benefit of discussion in a social setting, and the outcome of the discussion may be an indicator of the reasons for a changed bid.

Finally, in a climate where both national and international agreements exist which seek to enhance public participation in environmental decision making it seems clear that the process should rely on more than just economic estimates of value as provided by traditional CV. Whilst such estimates are still useful, policy makers are increasingly required to incorporate decision making, planning and management into one process, and include both expert and lay opinion within it. New methods which are able to provide a more holistic approach to environmental policy are needed so that these national and international targets can be met. The CJ is able to offer such an integrated approach. Evidence from the CJ shows that the Jurors were able to think holistically. One of the recommendations was that the Ettrick Project should not be considered in isolation, but as part of a suite of projects, to ensure that the Borders environment developed in an integrated way. The valuation workshop also provided a more integrated approach, in which participants were able to complement economic estimates with wider indicators of values and preferences.

In many instances where environmental project evaluation is required, conducting both a CV and CJ would be prohibitive in terms of time and money. The challenge for the future may therefore lie in developing complementarity. Building on the valuation workshop approach, and increasing sample sizes may go further in offering a more appropriate combined approach, so that decision makers can benefit from both a wide range of policy relevant information when evaluating environmental projects.

Acknowledgements

This work was funded by the Economic and Social Research Council under the Global Environmental Change Programme, and the Scottish Executive Rural Affairs Division. We would also like to thank the Borders Forest Trust, and the people of the Borders for their input and enthusiasm.

References

Aldred J., Jacobs M. 1997. "Citizens and Wetlands. What Priority, if any, Should be Given to the Creation Of Wetlands in the Fens?" *Report of the Ely Citizens Jury*. Cambridge

Alvarez-Farizo, B., Hanley, N., Wright, R.E., and MacMillian, D.C. 1999. "Estimating the Benefits of Agri Environmental Policy -: Econometric Issues In Open-Ended Contingent Valuation Studies. *Journal of Environmental Planning and Management*, 42: 23-43.

Arrow K., Solow R., Portney P.R., Leamer E.E., Radner R. and Schumann H. 1992. *Report of the NOAA Panel on Contingent Valuation*. Washington DC. Resources for the Future.

Blamey R. K. 1996. "Citizens, Consumers and Contingent Valuation: Clarification and the Expression of Citizen Values and Issue-Options" In *Forestry Economics and the Environment* ed. W.L. Adamowicz, P.C. Boxhall, M K, Luckert, W E., Phillips W A, White. Oxon: CAB International.

Boyle, K.J. and Bergstrom, J.C. 1999. "Doubt, Doubts and Doubters" In: *Valuing Environmental Preferences. Theory and Practice of the Contingent Valuation Method in the US, EU and Developing Countries*, edited by Bateman, I. and Willis, K.G. Oxford:Oxford University Press.

Boyle, K.J., Johnson, F.R., McCollum, D.W., Desvougues, W.H., Dunford, R.W., and Hudson, S.P. 1996. "Valuing Public Goods: Discrete Versus Continuous Valuation Responses." *Land Economics*, 72:381-396.

Brown T. C., Peterson G. L., Tonn B. E. 1995. "The Values Jury to Aid Natural Resource Decisions." *Land Economics*, 71, 250-260.

Carson, R.T., Groves, T., and Machina, M.J. 1999. "Incentive and Informational Properties of Preference Questions." *European Association of Resource and Environmental Economists Conference*, Oslo.

Coote A. and Lenaghan J. 1997. *Citizens' Juries: Theory into Practice*. London: Institute for Public Policy Research.

Crosby N. 1995. "Citizens Juries: One Solution for Difficult Environmental Questions." In *Fairness and Competence in Citizen Participation*. Ed. O. Renn, T. Webler, P. Wiedemann Dordrecht: Kluwer Academic press.

Elster J. 1983. *Sour Grapes. Studies in the Subversion of Rationality*. Cambridge: Cambridge University Press.

Gregory R., Flynn, J., Johnson S. M., Sattfield, T. A., Slovic P. and Wagner, R. 1997. "Decision-Pathways Surveys: A Tool for Resource Managers." *Land Economics*, 73:240-254.

Hannah, L. (1998). *Ettrick Floodplain Restoration Project Management Plan*. Edinburgh: Borders Forest Trust.

Hausman J. A. 1993. *Contingent Valuation: A Critical Assessment*. Amsterdam: North-Holland.

Jacobs M. 1997. "Environmental Valuation, Deliberative Democracy and Public Decision making Institutions." In *Valuing Nature? Economics Ethics and Environment*. Ed. J. Foster. London: Routledge.

James R.F. and Blamey R.K. 1999 *Public Participation in Environmental Decision –Making – Rhetoric to Reality?* Paper presented to the International Symposium on Society and Resource Management, Brisbane Australia.

Kenyon, W. 1999. *Report of the Galasheils Citizens' Jury*. Edinburgh, Scottish Agricultural College.

MacMillian. D., Smart, T.S., and Thornburn, A.P. 1998. *The Importance of Realism to Experiments Comparing Cash and CV Charitable Donations: The Case of the Isle of Eigg Trust*. Agricultural Economics Society Conference, Reading.

Mitchell, R.C. and Carson, R.T. 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Washington, D.C: Resources for the Future.

Mourato S. and Pearce, D. 1999. *Dealing with Low Willingness to Pay for Cultural Heritage: Statistical and Policy Implications*. Paper presented to the European Association of Agricultural and Resource Economics Conference, Oslo.

Munro, A. and Hanley, N. 1999. "Information, Uncertainty and Contingent Valuation." In *Valuing Environmental Preferences. Theory and Practice of the Contingent Valuation Method in the US, EU and Developing Countries*, ed. Bateman, I. and Willis, K.G. Oxford:Oxford University Press.

Office for Public Management. 1999. *Waltham Forest HAT Citizens' Jury*. London: Office for Public Management.

Payne, J.W. and Bettman, J.R. 1999. "Measuring Constructed Preferences: Towards a Building Code." *Journal of Risk and Uncertainty* 19:243-270.

Pretty, J., I. Guijit, Thompson, J. and Scoones, I. 1995. *Participatory Learning and Action: A Trainers Guide*, London: IIED

Ready, R., Buzby, J.C., and Hu, D. 1996. "Differences Between Continuous and Discrete Contingent Valuation Estimates." *Land Economics*, 72:397-411.

Sagoff, M. 1988. *The Economy of the Earth : Philosophy, Law, and the Environment*, Cambridge:Cambridge University Press.

Sagoff M. 1998. "Aggregation and Deliberation in Valuing Environmental Public Goods: A Look Beyond Contingent Pricing." *Ecological Economics*. 24:213-230.

Stewart J, Kendall E, Coote A. 1994. *Citizens' Juries*. London: Institute of Public Policy Research.

United Nations. 1993. *The Global Partnership for the Environment and Development. A Guide to Agenda 21. Post Rio Edition*. New York: United Nations.

Endnotes

ⁱ Figure obtained from the Borders Forest Trust.

ⁱⁱ The Borders Jury was selected in this way to minimise recruitment costs. Despite the final Citizens' Jury being a reasonable representation of the Borders population, this is probably not the best means of Jury selection. Selection processes utilising a random draw from the electoral register are considered to provide a better sample of jurors.

ⁱⁱⁱ The two respondents who changed from a "don't know" to a positive bid were taken out of the sample for the purpose of the test.

TABLE 1. PROBIT ON VARIABLES INFLUENCING THE PROTEST DECISION

Variable		Probit
CONSTANT		-0.9942*** (0.4246)
LOGINC	Log of income	-0.0332** (0.0166)
AGE	Age	0.0097** (0.0046)
EDUC	Level of education	0.0095 (0.0484)
Q2	Participation in outdoor activities	0.0848* (0.0462)
Q10	Likely to visit the area with the project	-0.1501** (0.0676)
Q18	Membership of environmental organisation	0.0512 (0.1441)
DECID	Preference for deciduous woodland over other habitat	0.0172*** (0.0058)
χ^2 (df)		31.87 (7)
LOG-L		-191.95
N		336
P		0.0000

Standard error in parenthesis

significant at *90%, ** 95%, ***99%

TABLE 2. DESCRIPTIVE STATISTICS FOR WTP FOR THE ETTRICK PROJECT (£
PER PERSON)

Mean	Std Dev	Range	95% Confidence Intervals	N
13.18	69.71	0 - 1000	4.15 - 22.1	232

TABLE 3. HECKMAN SELECTION MODEL ON WHETHER TO PAY AND HOW MUCH TO PAY

		Probit	OLS
		(stage 1)	(stage 2)
Constant		2.1549***	33.4833
		(0.3869)	(38.9387)
LOGINC	Log of income	-0.005	1.9132
		(0.0216)	(2.0312)
AGE	Age	-0.0082	
		(0.0057)	
EDUC	Level of education	0.1439**	
		(0.0639)	
Q8	Whether prefer with project	-0.6655***	-24.8333
		(0.1537)	(29.6855)
Q10	Likely to visit the area with the project	-0.4377***	-20.4472
		(0.0884)	(19.7772)
Q12	How many times visited in last year		12.2543**
			(5.6568)
Chi ² (df)		92.06(5)	
lambda			58.03
			(60.0477)
Log-L		-114.47	-720.46
N		232	122

standard error in parenthesis

significant at *90%, ** 95%, ***99%

TABLE 4. POSITIVE ISSUES IDENTIFIED ON THE ETRICK FOREST FLOODPLAIN PROJECT

• preservation of a natural ecosystem - a world resource	• good demonstration scheme for copying
• flood control	• preservation of indigenous life forms
• balance of different habitats	• education of the young and encouraging educational studies
• encouraging wildlife	• getting back to nature
• monitoring of species	• decrease the number of sheep and fencing of sensitive areas
• community involvement	• getting rid of blanket forestry

TABLE 5. JURY SUGGESTIONS ON HOW ENVIRONMENTAL PROJECTS SUCCESS
CAN BE MEASURED

-
- has it got community and farmer approval?
 - has the variety of wildlife improved? And is it being protected?
 - has community spirit improved?
 - has the project created any unseen problems?
 - is the site attractive?
-

TABLE 6. THE ORIGINAL BID, THE REVISED BID AND THE REASON FOR THE CHANGE.

Original bid	Revised bid	Reason
25	50	Wish it would happen
10	20	It would have a beneficial effect on the local community, Borders community, and is a valuable recreational and educational asset
25	50	Awareness of the problem
20	??	Would be willing to sponsor the project on a monthly basis
DK	10	More knowledge
DK	25	Because of points for the project brought up in the discussion

TABLE 7A. DESCRIPTIVE STATISTICS ON WTP FOR INITIAL VALUATION (N=27)

Mean	Median	Std Dev	Range	95% C.I.
11.07	10	12.59	0-50	6.09 – 16.05

TABLE 7B. DESCRIPTIVE STATISTICS ON WTP FOR FINAL VALUATION (N=29)

Mean	Median	Std Dev	Range	95% C.I.
13.59	10	12.59	0-50	7.64 – 19.54

TABLE 8. GOOD ASPECTS OF THE ETTRICK PROJECT

Good points	Examples	Rank
Protected area	Place of scientific interest	1
	Protected area	
Wildlife	Increase wildlife	2
	Varied wildlife	
	Protect wildlife	
Jobs	Create jobs	3
	Attract people to the area	
Local/outdoor interest	Somewhere to visit	4
	More interesting countryside to walk on	
	Makes people more aware of the environment locally	
Reduce chemicals on land	Reduce chemicals on land	5
Less cultivated	Less cultivated, more natural	6

TABLE 9. PROBLEMS, SOLUTIONS AND IMPORTANCE OF BAD ASPECTS OF THE
ETTRICK PROJECT

Problems	Rank	Solutions
Costs who pay	1	Start up cost: central funding lottery EU Running cost: 3 for admission fee, 3 against Prevent damage by visitors
Rural depopulation – Reduction of number of viable farm	2	Change/expansion of jobs related to the exercise e.g. catering, maintenance, paths, bridges etc Rangers Tourism facilities Farm shop/equipment hire shop
Access roads	3	Straighten roads Bridges Improved public transport i.e. mini buses
Agreement with landowners	4	No solutions offered
Damage by visitors	5	Designated picnic area and toilets Designated play area
Car parking	6	No solutions offered

ⁱ Figure obtained from the Borders Forest Trust.

ⁱⁱ The Borders Jury was selected in this way to minimise recruitment costs. Despite the final Citizens' Jury being a reasonable representation of the Borders population, this is probably not the best means of Jury selection. Selection processes utilising a random draw from the electoral register are considered to provide a better sample of jurors.

ⁱⁱⁱ The two respondents who changed from a "don't know" to a positive bid were taken out of the sample for the purpose of the test.