

**THE *VALUES JURY* ON TRIAL:  
A MODEL FOR PUBLIC CONSULTATION**

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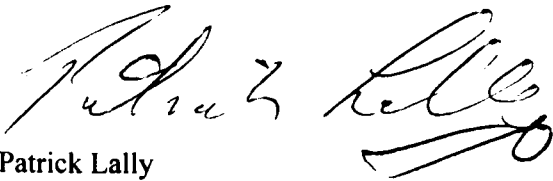
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### **Declaration of originality**

I hereby certify that this thesis, submitted to the Graduate School of the Environment in fulfilment of the degree of Doctor of Philosophy, is my original work and that I have not submitted this document or any part of it for any award at any other institution. To the best of my knowledge, this thesis contains no copy of material previously written by any other person except where due reference is made in the text.

A handwritten signature in black ink, appearing to read 'Patrick Lally', with a stylized flourish at the end.

Patrick Lally

4 October 2000

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## **Abbreviations**

<b>ARA</b>	<b>Acceptable risk analysis</b>
<b>CAC</b>	<b>Citizens' advisory committee</b>
<b>CBA</b>	<b>Cost-benefit analysis</b>
<b>CC</b>	<b>Collective choice (techniques)</b>
<b>CJ</b>	<b>Citizens' jury</b>
<b>CM</b>	<b>Choice modelling (technique)</b>
<b>CV</b>	<b>Contingent valuation</b>
<b>DA</b>	<b>Decision analysis</b>
<b>DOI</b>	<b>Department of the Interior (United States)</b>
<b>EIA</b>	<b>Environmental impact assessment</b>
<b>EIS</b>	<b>Environmental impact statement</b>
<b>FA</b>	<b>Financial analysis</b>
<b>IA</b>	<b>Impact assessment</b>
<b>NOAA</b>	<b>National Oceanic and Atmospheric Administration (United States)</b>
<b>NPV</b>	<b>Net present value</b>
<b>RBA</b>	<b>Risk-benefit analysis</b>
<b>RP</b>	<b>Revealed preference (techniques)</b>
<b>SMS</b>	<b>Safe minimum standards</b>
<b>SP</b>	<b>Stated preference (techniques)</b>
<b>TC</b>	<b>Travel-cost (valuation)</b>
<b>VJ</b>	<b>Values jury</b>
<b>WTA</b>	<b>Willingness-to-accept</b>
<b>WTP</b>	<b>Willingness-to-pay</b>



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## Abstract

The imprecision with which many of the traditional models of public consultation actually capture people's concerns and preferences has encouraged research into alternate forums. Recently, attention has shifted to the more innovative so-called 'deliberative institutions'. These are models of consultation that limit participation but focus on revealing the well-informed views of a relatively small number of constituent representatives, rather than relying on the less-informed views of the broader public. The principle objective of this thesis is to report on the results of a series of trials involving the application of one of these new deliberative models, the *values jury*.

The values jury draws its name from the related model of public consultation, the citizens' jury (CJ). It holds many of the characteristics of the CJ approach but it is also designed to reveal an additional vital factor, namely the intensity with which people hold values toward collective assets.

A series of trials was conducted throughout New South Wales to establish the efficacy of the values jury model. The principle focus was on revealing people's preferences in the context of hypothetical threats to local environmental and related assets. A contingent valuation-style format for capturing values was incorporated into the process. In total 100 selected jurists representing four separate communities participated in the trials.

As part of the trial process, participants were provided with a range of information, including a courtroom-style debate by expert advocates, about a specific environmental issue: the threat that continuing irrigation water usage poses to the sustainability of the Macquarie Marshes. Results confirmed that trade-off measures are identifiable with each irrigation-related job in the Valley being considered equivalent to 1.6 km<sup>2</sup> of increased wetland. Other topics of public concern were also included to identify how well they could be incorporated into the values jury process. The model appears to be able to cope with a reasonable variety of such topics.

As part of the trial review process, participants were asked to confirm their perceptions of the values jury in terms of its capacity to provide for the twin objectives of *fair* and *competent* discourse. Criteria based on Habermas's theory of communicative action were used as the template for this assessment. Overall, the jurors' responses were strongly affirmative for both objectives. This was the inaugural attempt at trialing the values jury process and the results indicate that the model holds considerable potential for use in a wide variety of applications, particularly where the quantum of stakeholder values is the focus of attention.

# 1 INTRODUCTION

## 1.1 General objective of the thesis

The *values jury* (VJ) is a novel model of public participation designed to provide social planners and decision-makers with information about the intensity of preferences held by affected communities toward local public goods. The principal objective of this thesis is to report on the efficacy of the VJ process as determined by a series of trials conducted in New South Wales relating to a range of hypothetical threats to various public goods.

The role of a VJ is to reflect the underlying strength of values held by the impacted public, using economic measures, revealed in a setting that encourages fair and competent discourse between participants as representatives of their respective communities.

Fundamentally, the values jury is a consultative model that encourages inclusive deliberative discourse. It is a logical extension of the citizens' jury (CJ) process that has evolved in the United States and Europe in recent years to contend with a range of issues under circumstances where public input has been sought. The CJ process invites members of the public to engage in dialogue in a group setting to determine their sentiments toward a particular locally-impacting project or threat. The outcome is usually a vote for, or against a specific proposal. The jury may also recommend approval subject to specific conditions. CJs – along with other novel methods of determining collective preferences – have emerged as a result of a growing demand for greater public input into the decision-making processes of public authorities.

One major inherent difficulty with CJs is that they are unlikely to be favoured by those seeking an economic account of the strength of public preferences. This is because there has been very limited work to date on expanding the charter of CJs to confirm their adaptability to assessment of preferences using an economic metric as the basis for demonstrating intensities. Instead, this aspect of public measurement has tended to remain within the realm of stated-preference methods such as contingent valuation (CV). CV is a generic term for a range of survey-based methods of assessment that utilise monetary measurements to register the strength of public preferences and is often applied to environmental goods. It has also been adapted to a wide range of issues in a variety of forms. Most commonly its use has been associated with revealing people's willingness to pay (WTP) to avoid a public-issue loss, or their willingness to accept (WTA) a payment in return for permitting the loss to occur. The CV model is widely acknowledged as seriously flawed, but, to date, in the absence of more reliable methods,

remains the model of choice most widely used to elicit estimates of public value for inclusion in cost-benefit analyses.

The values jury represents an attempt to bridge the nexus between citizens' juries and contingent valuation, as a means of revealing the intensity of people's preferences in a deliberative, inclusive, forum.

## **1.2 Specific objectives of the study**

Several significant objectives are associated with this study:

- This thesis aims at providing a broad framework for the novel integration of a stated-preference valuation method within a deliberative, collective choice model. To date, there has been considerable criticism of stated-preference techniques and this has tended to isolate their use away from collective choice applications. This thesis provides a basis for the selective integration of the two processes.
- Although the central focus of the thesis is to report on the overall performance of the VJ model, it is due to the VJ process having *fairness* and *competency* in participant involvement as its ultimate twin goals, that an important objective is to report on the model's capacity to achieve these.
- Due to its relatively novel character, a set of recommended operating protocols is derived for the further application of the VJ model. These are generated from the outcome of the trials undertaken as part of this research project.
- Although the focus is on the VJ process, the thesis also reports on the outcomes of the measure of values revealed by the participants in the process. These are identified relative to a range of goods that hold some degree of public value. The purpose of this is to provide evidence of the degree of integrity of the stated-preference technique employed.
- The final objective of this thesis is to test for the effects of several factors often highlighted in the literature relating to public preference and taste. These include the presence of a distinct *consumer* versus *citizen* mode. Another is to test for the presence of an asymmetric value function in the responses of the participants. A final one is to determine if the processes employed provide a practical opportunity to reveal people's social discount rate.

### 1.3 Significance and novelty

Issues of public concern, including those relating to the environment, are at the intersection of science and politics, involve subtle and uncertain risks, are often associated with large temporal and spatial scales and a myriad of conflicting issues and values. There is no model of public participation that can claim to satisfactorily synthesize all of these facets of concern. The problem is exacerbated by the often-inconsistent demands of public authorities for data to be provided in a variety of forms with variable, and sometimes even erratic emphasis on specific aspects of the issue. The VJ process, as reported in this study, can not claim a position of special privilege in satisfying all of these issues. What it *can* claim to offer is a process of public participation that attempts to coalesce two disparate techniques for preference assessment relating to public goods. These techniques are contingent valuation, and the collective choice model of citizens' juries.

No other method of deliberative, public participation has been derived which satisfactorily unites the use of economic preference measurement within an objectively *fair* and *competent* discursive model. An attendant problem is that there is also no widely recognised method of measuring the level of satisfaction that parties may have with the discursive elements of a public consultation process. The problem is one that is most obvious when authorities commission public forums that satisfy neither the demand for adequate consultation, nor the sponsor's desire to adequately determine what the impacted public actually feel about the issue. The usual outcome is an identifiable frustration with the process. This study adopts a unique method of measuring the degree of discursive inclusiveness experienced by the participants in the VJ process. The method aims at establishing how fair and competent the VJ process is, as perceived by the jury members. It is an adaptation of a model of discourse assessment suggested by Habermas (1981 [cited in Renn, Webler and Wiedemann 1995b], 1984, 1987) and refined by Webler (1995).

As the name suggests, a values jury is composed of a limited number of members of an impacted community, representing the interests and concerns of that constituency. The jury process is based on the model of judicial trials rather than public surveys and so is focussed on revealing the preference orientation of a small, well-informed sample of the community, rather than the (potentially) uninformed views of a larger group. The jury exercise may proceed over a period of hours, or up to several days, depending on the nature of the issue. By providing sufficient time, the jury has the capacity to become very acquainted with the issue under scrutiny. For this reason the VJ process offers a unique opportunity for participants to explore the details of a proposal prior to making their contribution to the final outcome.

A question not examined in any of the citizens' jury literature is that of the statistical significance of the jury size. It appears that because the CJ model has evolved from the judicial model, it has been assumed that no statistical reliability can be placed on such a relatively small sample of the impacted community. This is despite reports of citizens' jury trials being conducted composed of up to 25 members rather than 12, which is the common standard for criminal trials (Carson 1994, 1995, Coote and Leneghan 1997, Crosby 1995, O'Hara 1996). This thesis examines the statistical basis for determining a 'reasonably representative' jury size and recommends a minimum juror number that is both manageable and defensible.

The challenge of dealing with several contentious issues that are recurrent in economic theory is also accepted within the series of VJ trials. These issues are most often associated with problems of identifying the intensity of public preferences for non-market goods. These include assessment of the public's social discount rate(s), and analysis of people's willingness to adopt a *citizen* mode rather than the typical *consumer* one when considering issues of public choice. Also considered is the issue of identifying people's indifference curve maps relating to public-cause values, and determination of the extent to which people hold an asymmetric value function toward such public goods. Each of these concerns has received wide attention in the literature but no study has as yet been undertaken to reveal their measure in a deliberative, public forum.

Finally, and possibly most significantly, the values jury trials implemented as part of this thesis are the first to be reported anywhere in the world.

#### **1.4 Scope**

The values jury model has its roots in the citizens' jury process. CJs have been used to elicit public sentiment toward a large range of issues since their first trial in the early 1970's. They have been used at all public administration levels but most commonly the issues being addressed have been of national significance. Most have related to health and public welfare topics (Coote and Leneghan 1997). There appears to be no *prima facie* reason why the scope of the CJ method could not be widened to deal with a much broader range of topics including environmental issues. As a variation of the CJ model, the VJ model in this study has been applied to issues that have a strong 'local' orientation. Similarly, there is no obvious reason why the VJ model could not be adapted for use on a range of issues that have a much wider spatial and temporal scale.

The issues presented to each of the juries in this series of trials were hypothetical, and while they were expected to generate some degree of emotional response, it should be understood that under these circumstances it is almost impossible to avoid the potential for ‘hypothetical bias’ to enter into the exercise. Hypothetical bias implies that participants may structure their responses to questions in such a way that they do not precisely reflect their actual level of concern for the issue. This type of bias is common to many forms of public survey, and is particularly prone to exist in contingent valuations. Although it is difficult to avoid such a bias in a survey environment, a concerted attempt was made to limit the potential for other common forms of bias to enter into the VJ trials (refer appendix 2 for an extensive range of potential biases). Despite this, the very nature of the VJ process, as executed in the trials, is open to criticism regarding issues of bias, as well as validity and reliability. This criticism is acknowledged in advance on the basis that the VJ trials, while not capable of mitigating all of the issues regularly associated with the perceived inadequacies of existing models, have been constructed in a format that recognises them and attempts to minimise their impact to the extent possible.

Due to its very novel character, the VJ process is not recognised by any public authority as yet as a viable means of eliciting valid and reliable measures of citizen values. For this reason, the scope of the VJ trials in this report is necessarily limited. No attempt has been made to seek the opinion of public authority policy-makers regarding the further potential of the model.

The VJ trials were conducted in four locations throughout New South Wales in mid-1999: Warren, Dubbo, Mudgee, and Strathfield (Sydney). The sites were selected based on specific criteria. This obviously leaves considerable scope for any following VJ researchers to validate the efficacy of the process in a wide range of locations associated with an almost infinite span of issues.

The issues raised for consideration by the participants focused largely on localised hypothetical topics constructed deliberately for the VJ exercises. Each was considered to be relevant to the four communities where the trials proceeded. An obvious variation to this pattern was the inclusion of a topic - the decline of the Macquarie Marshes - which was ‘local’ for the majority of the participants, but not so local for the participants in the Sydney-based trial. On this basis, while the general intention of the study was to limit issues to those that might fit the criteria of ‘local’, it will remain a topic of further research to establish whether the efficacy of the VJ process can be extrapolated to broader – possibly even universal – issues.

## **1.5 Research approaches**

The nature of the values jury research topic and objectives is such that the overall approach is well suited to the application of a design based on the format of an experiment. Unfortunately, under actual field conditions, many factors having the potential to influence the outcome of the process are difficult to control, and so the overall approach is possibly most appropriately described as a field-based quasi-experiment.

Although this general approach reflects one of a semi-controlled experiment, the emphasis given to the exploratory purposes for which the study has been designed implies that other research approaches are needed to identify specific sub-components of the issues under investigation. In particular, due to the incorporation of various aspects of the contingent valuation model into the VJ design, the study also relies in part on data collection methods that are specifically grounded in a survey-based approach. This is necessary simply because the contingent valuation process itself is almost exclusively based on such an approach.

While the quasi-experiment and survey approaches imply a strong reliance on quantitative data analysis, a further novel aspect of this study is its inclusion of qualitatively-based content analysis. Throughout the duration of the VJ exercises participants were encouraged to express their personal feelings and attitudes in writing relating to the specific topic being considered: an approach common to many qualitative research designs. Analysis of this 'set of free-form responses is also included as part of the thesis.

## **1.6 Structure of the thesis**

This thesis is intended to provide a logical examination of the background, application, and interpretation of the values jury trials. To enable this, the thesis is divided into six chapters.

A broad introduction to the social and economic basis for the need to reveal people's intensity of attachment to public goods is provided in Chapter one.

A much more detailed review of the problems and issues attendant to assessing non-market derived preference intensities is the focus of Chapter Two. The logical antecedents for the values jury process and the basis for assessing its efficacy are also included in this chapter. It also contains an analysis of the fundamental elements that characterise the VJ process.



Methodological issues associated with the trial of the VJ model are discussed in Chapter Three. The chapter is divided into three sections dealing with each of the following:

1. Detailed description of the implementation of the study.
2. Overview of the methodology adopted for the assessment of efficacy with regard to the VJ approach.
3. Description of the framework associated with the analysis of the statistical and economic data derived from the trials.

The results of the data analysis are provided in Chapter Four.

Chapter five presents a discussion of the results of the trials.

The details of the conclusions drawn from the trials and their implications are included in the final chapter.

### **1.7 The problem of measuring the intensity of preferences**

The problem of measuring the range of both economic and non-economic values, and the intensity of interests associated with any public issue in democratic theory<sup>1</sup>, has never been satisfactorily resolved. The typical statement of the problem depicts the victory of a lethargic majority over an intense minority, to the detriment of either one's sense of equity and efficiency or in the extreme, to the viability of the political process itself (Mueller, Tollison and Willett 1993). Re-stated, the issue concerns how to design public-choice mechanisms to solve the intensity problem and accurately reflect the underlying preferences of those who are impacted by the outcomes.

Although analysis of public decision-making processes extends back to the earliest philosophers, in the past few centuries it has fallen within the stream of works by political theorists including Hobbes, Spinoza, Madison and de Tocqueville. In more recent years it has been subject to the considerable influence of welfare-based economic theory. It has also been separated from much of the earlier work however, by the introduction of the analytical tools of economics.

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1. Democratic theory holds that it is appropriate to seek to incorporate the widest possible range of actors as full participants in governance, and not simply as objects of decision-making and management.

One of the most significant developments in welfare economics has been the fostering of interest in market failure. Much of the work in this field originated as late as the 1940's and 50's (Galbraith 1989). It has centred on establishing conditions for efficient allocation in the presence of market failure. This has led to a considerable amount of research into the development of non-market procedures for revealing individual and grouped preferences. The intended outcome is to derive an expression of values in a format suitable for inclusion in the public decision-making process.

### 1.7.1 Defining 'value'

Much of the work associated with the revelation of value in the absence of market-related data has been generated by reference to environmental issues, usually concerning the diminution or loss of a prominent feature. But this has raised many further issues reflecting questions about the spectre of appropriateness. Most environmentalists are suspicious of efforts to place values on components of the environment<sup>2</sup> in economic terms. It is a mistrust that is shared by other public-issue advocates. In reality, the problem of value is as old as philosophy if one accepts that human values are linked to ethics and moral behaviour. Although the idea that economic values could be attributed to almost anything has been dominant since trade and commerce began, it was Adam Smith in 1776 who observed that at least two types of value persisted (Smith 1961). *Value in use* expressed the utility of an object, according to Smith. *Value in exchange* identified its relative purchasing power.

The two types of value troubled Smith. As Galbraith (1989) points out,

'As in the case of drinking water, the value in use could be very high, the value in exchange very low. Precious stones were low in use, high in exchange value. The riddle of value in use and exchange would not be resolved for another century or more, until, in one of the lesser triumphs of economic theory, the concept of marginal utility was discovered. The utility of water is diminished, *pro tanto*, by its abundance; that of the diamond is kept high by its scarcity' (Galbraith 1989 p 65).

Smith resolved the problem in his time by simply setting value in use aside and asserting a value in exchange that is a version of what was later to be known as the Labor Theory of Value: the

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2. The environment is taken as inclusive of all features of historic, scientific, cultural, social, archeological, architectural, aesthetic, as well as natural significance. It represents the full range of features that hold value to humans both in the present and to potential future generations. This definition is consistent with that supported by the International Council on Monuments and Sites (ICOMOS) (refer, for example, Kyle and Walker 1992), and defined in legislation such as the *Heritage Act (NSW) 1977* as well as the *Environmental Planning and Assessment Act (NSW) 1979*.

worth of any possession is ultimately measured by the amount of labour for which it could be exchanged.

It was not until the second half of the nineteenth century that philosophical work on value in use began to develop in earnest. It came to be known as axiology (from the Greek *axias*, meaning worthy or worthwhile), a term first used by Urban (1909), and matured in the so-called ‘Second Austrian School of Values’. The ‘First Austrian School of Values’ was a school of *economic* value theorists (Rescher 1975). Axiology came to mean the study of worthwhile things as well as the analysis of worthwhileness in general (Findlay 1970). Smith’s notion of *utility* was augmented by the ‘Second Austrian School’ and theorists such as Brentano, Meinong, and Ehrenfels, to include emotional attachment and desire. The new theory of values, axiology, was therefore based on psychological, rather than economic, explanation.

It was Perry (1950 p115) who advanced the axiological definition of value, ‘that which is an object of interest is *eo ipso* invested with value. Any object whatsoever it be, acquires value whenever any interest, whatever it be, is taken in it’. In other words, value is created by the valuer and *only* by the valuer. Values therefore are subjective. They are also primarily anthropocentric. It follows that the way to investigate value is to inquire about the interests of valuers: their intensity, preference and extent. Such an interest-based theory of value has obvious links with economic value theory based on consumer preferences. The major difference between neo-classical economic value theory and preference-based axiological ones is the complete lack of any budget constraint in the latter. Additionally, there are no systematic equivalents to the technical cost-based supply curves of the former. Despite this, the two theories of value are remarkably similar.

In *classical* economic value theory, whether Marxist or Ricardian, the status of value is clear. Value is embodied into an economic entity by the amount of labour or corn (or whatever) required for its production and this tends to define price. *Neo-classical* economics however, discards this crude supply-cost procedure and replaces it with an interplay between supply and demand. Demand is relative. It depends on the availability of other goods and their price, and the preferences of all other consumers<sup>3</sup>. Although the foundations of neo-classical ideas were

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3. Although this may be taken to imply that the ‘market value’ of a good is solely determined by the supply-demand interplay, many other forms of value are also identified by reference to this activity. These include – but are not limited to – replacement value, insurance value, repair value, security value, productive value and rental value. Because the ‘market’ is the source for identification of each of these values, it is assumed in this thesis that the broad term ‘market value’ is endowed with the capacity to reveal each of these associated forms of value.

laid down in the decades around the turn of the twentieth century, it was not until the late 1950's that Debreu (1959) was able to present what was claimed as a full and consistent general theory of competitive equilibrium. It was around this time that welfare economics began to mature as a normative discipline focusing on the primary goal of evaluating the social desirability of alternative allocations of resources (see, for example, Henderson and Quandt 1958). The fundamental premise of welfare economics is that the preferences of individuals should count, and that therefore value, in the economic sense, is ultimately derived from individual preferences drawn from the range of possible choices.

The demand for the determination of economic values is now so widespread and dominant, particularly in decision-making, that by excluding issues such as environmental concerns from this domain may actually harm the environmental cause. Classical economists (including Smith) never overcame the problem of separating value as an object-embodied characteristic and as a property dependent on human perceptions. The problem of separating these objective and subjective aspects of utility perplexed classical economists until, at the end of the nineteenth century, the neo-classical transformation supposedly broke the impasse by locating value inside the head of the individual and rejected any theory of embodied, objective value. By asserting that value firmly lay in human preferences it enabled valuation to include potentially anything that could form the focus of human desire. Thus, for example, in Marx's labour theory of value, questions about the relative value of some aesthetic element of an object made no sense because the characteristic may have attached itself to the object over time without the hand of labour being applied. However, as soon as value became rooted in human preference, questions about the value of aesthetic attributes became valid. The problem was in finding ways to identify their relative magnitude, particularly where trade-offs were necessary. The lack of universality that earlier theories of value had, was, at least in principle, overcome by the neo-classical evolution of economics.

Axiology never had any difficulty claiming universality. It was always focussed on broader issues of value including aesthetics, and gained little benefit from the hegemony of classical economics. It was the rise of neo-classical thinking that provided for the potential convergence of the two lines of value philosophy.

Although convergence has been possible, unity has never been achieved. The twin issues of a lack of budget constraint and absence of a cost-based supply function have kept the two streams of thought separated, leaving economists with the challenge of devising methods to achieve a degree of congruence. Environmental economics, for example, has actively encouraged

research into methods such as hedonic pricing, travel-cost valuation (TC), and contingent valuation (CV), to determine value in the absence of direct market evidence. Each of these is firmly rooted in neo-classical economic logic. That is, they assume an individual budget constraint exists, and that even for apparently absent cost-based supply schedules, proxies can be estimated. The fact that ‘preference’ and ‘desire’ can seem sometimes boundless, makes any attempt to measure the value of an environmental feature with such subjectively-held characteristics a problematic one. For example, the ‘value’ of a scenic waterfall may be estimated by a TC or CV approach in such a way that the valuation reflects the amount of money people would be prepared to spend to see it, or to offer as a donation to save it from destruction. The assumption of a budget constraint is fundamental to this process. Aggregating people’s willing to contribute – or, more formally, their willingness to pay (WTP) – is meant to provide an indication of the total value of the waterfall. The fact that some people may be unwilling to ‘prostitute’ the waterfall by nominating a figure under these circumstances, and that others may even be willing to have personal harm done to themselves rather than see the destruction of the waterfall, suggests that measures derived under these circumstances may only vaguely reflect deeper held (axiological) values (Prior 1998).

### 1.7.2 Revealing ‘value’

A central tenet of neo-classical economic thinking is that it offers a unique optimisation of human welfare as expressed in value terms. For example, cost-benefit analysis<sup>4</sup> (CBA) is a basic tool in the neo-classic armory, and its claim is to correct for distortions in the market – including the presence of ‘externalities’, and ‘market failure’ – and thus move closer to an optimal allocation of resources (often referred to as a Pareto optimal allocation). Unfortunately, the application of neo-classic methods has uncovered many problems. These include difficulties with defining Pareto optimality, and the fact that if the actual market is far from optimum then there is no guarantee that the use of price adjustments to compensate for externalities will move society closer to this optimum. This raises important issues fundamental to the challenge of determining economic, and in particular, environmental, values. The rules of neo-classic economic valuation cannot be said to constitute a scientific theory capable of generating rigorous laws to define appropriate social activity. Despite this, they do provide a basis for valuation ‘so long as they are socially accepted by a broad enough group’ (Prior 1998 p436). Just what ‘broad enough’ means in practice is a difficult problem, but the theories of neo-classic economic valuation cannot be elevated to the level of any kind of scientific law.

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4. CBA seeks to assess all the benefits, and all the costs of a policy, proposal or project, and determine if it is worthwhile. The decision rule is that if the benefits exceed the costs, then the project should proceed.

Instead, they should be regarded as a particular perspective through which aspects of the world are interpreted (de Vaus 1995).

Although the question of determining whether economic efficiency is truly identifiable remains a vexed one, economists generally continue to rely heavily on the welfare-based notion that the fairest means to resolve the issue associated with resource allocations and trade-offs is embodied in the use of cost-benefit analysis (CBA). CBA is seldom used as the sole arbiter in the determination of the preferred outcome, and instead is often employed in association with other types of analyses including risk-benefit analysis (RBA), acceptable risk analysis (ARA), safe minimum standards (SMS), impact assessments (IA), and decision analysis (DA). The attraction of the CBA concept lies in its use of a single metric – commonly a monetary measure – that provides decision-makers with a reasonably straight-forward means to assess both the issues impacted by a policy decision and also the magnitude of impact. In many ways there is a cognitive simplicity to the concept of CBA that tends to favour its use over that of alternative measures and analyses.

In a CBA, proposed re-allocations of resources – incorporating a potential change to economic welfare levels – are valued in a common metric (usually dollar terms). However, concern often exists that the market does not adequately reflect values for the aspects involved in the analysis. Under these circumstances, where factors beyond those evidenced by mere market transactions are involved, then alternative means of determining magnitudes are required. Identification of collective axiological values may be included in this category. As noted previously, the valuation methods now more commonly used include hedonic pricing, the travel-cost method and CV analysis. These methods generally fall into two distinct classes, namely: revealed preference (RP) techniques, and stated preference (SP) techniques.

*Revealed preference techniques* rely on the inference of values from people's actions in the markets which have a clearly defined – although, often indirect - relationship with the resource under consideration. For instance, the value of a scenic vista to homeowners along a cliff top may be inferred from the prices of their real estate. This class of methods includes hedonic pricing and travel-cost techniques. But RP techniques have serious limitations (Bennett, Blamey and Morrison 1997). They can only provide *ex-post* values and are thus unhelpful when new circumstances emerge as a result of a policy change. They also suffer from a limitation associated with direct use of some resources or features. That is, they have an inherent difficulty in identifying non-use values that may incorporate social responsibility associated with stewardship, intergenerational considerations, and broader public amenity. As a

result, RP techniques provide little evidence that may demonstrate the magnitude of axiological value. To fill this void, stated preference techniques have been devised.

*Stated preference techniques* use responses of a sample of people who answer a set of questions specifically designed to generate estimates of non-market values. It is usual for participants to answer hypothetical questions such as, 'what would you pay if...?' The array of SP techniques includes contingent ranking, contingent rating, choice modelling and contingent valuation. Because of the flexibility of the hypothetical format, SP surveys tend to avoid the deficiencies of the RP techniques. This is not to imply that they are without their own limitations. Contingent ranking and rating techniques have theoretical problems, and choice modelling remains in its early development stage (Morrison *et al.* 1996). Despite its own limitations, and somewhat by default, contingent valuation has become the best known and widely used SP technique. In the absence of a viable and theoretically superior technique, CV is likely to retain its prominence.

A third class, which should possibly be incorporated as a sub-class of SP techniques, having particular relevance to environmental decision-making, is that of collective choice (CC) techniques. The CC approach is one in which 'the observed outcome is taken to be the result of a specified process of collective choice which can then be associated with the demand of some decisive voter' (Oates 1996 p211). CC is premised upon the use of public participation techniques such as referenda, opinion polls, focus groups, and public meetings, to elicit the collective preference – often incorporating some form of majority verdict – of the participants. Although 'voting' in its more general form has existed as a means of identifying the will of the majority since debates about democracy began, the application of simple 'yes/no' answers typically associated with such procedures has largely defied conversion into purely economic terms. It is primarily because of greater demands for public participation and increased transparency in political decision-making in the past four decades that techniques aimed at capturing the collective preferences of the impacted public have been developed. In addition to those mentioned above, CC techniques have grown to include citizen advisory committees, citizens' panels and citizens' juries. While these techniques have not generally been applied to economic evaluation in the public setting, there appears to be no obvious hindrance to their broadened application in identifying the scale of collective values associated with any public resource.

In the Australian setting, despite encouraging attempts by public authorities to reinforce the need for initiatives in environmental valuation (see, for example, Department of Environment, Sport and Territories 1995), there has been a general reluctance to accept existing methods as

valid means by which to determine the scale of such values (Blamey, Common and Quiggin 1995, Bennett, Blamey and Morrison 1997). On this basis, those valuation exercises undertaken to date have either received considerable public criticism, or have been generally overlooked as fair estimations of value (Brunton 1991, Moran 1991). Under these circumstances, the best outcome that even a well-resourced valuation exercise could hope for would be some capacity to veto an adverse proposal rather than determine explicit values. This may not be a major problem if the object of the exercise is to determine if a veto is necessary. But the widespread application of environmental valuation exercises to provide little more than conjectural veto material is unlikely to be sustainable in the longer run: opponents will soon consolidate their critiques and encourage the demise of the particular valuation method. A growing need therefore exists for alternative valuation methodologies to be trialed and offered to policy makers, analysts and the broader research community for their assessment. As well as satisfying the common demands for validity, any novel method must also hold an inherent possibility for application in the prevailing economic, social and cultural setting. The fact that the predominant environmental valuation method – CV – has not generally achieved this on its migration from the international context to the Australian setting indicates that a need exists to fill the void that this has created.

### 1.7.3 Introduction to the ‘values jury’

While it is difficult to foresee a time when non-anthropocentric values will come to prevail in people’s preference ordering, the liberal democratic philosophy adopted in most Westernised societies suggests that a fair and equitable means of determining the magnitude of environmental values could possibly be derived from a convergence of economic principles with democratic processes (Abrams 1980). Importantly, Brown, Peterson and Tonn (1995) advanced the notion of expanding the liberal participatory democracy model of ‘citizens’ juries’ into environmental valuation assessments. They called the concept a *values jury*. Although they never actually trialed the concept (Brown 1997 pers. comm., Tonn 1997 pers. comm.), they provided a broad framework for the logic of its potential. Many of the issues raised by the inadequacies of existing public-issue valuation methods appear to be contended with by the values jury process.

At its core, if appropriately addressed, the jury process may be able to elicit – as far as is possible – an aggregated economic value that reflects the axiological value which so far has remained largely beyond the capacity of most valuation techniques. If this is the case, then the true preference value of certain aspects of, for example, the environment may be revealed for inclusion in CBA analysis. In addition, the valuation process is likely to more truly reflect the



amount of social welfare (in the economic sense) lost once a feature holding a public collective interest is destroyed or damaged. This, ultimately, is the goal of welfare-based neo-classical economics. The fact that the values jury concept was derived from liberal democratic theory should also provide comfort to those seeking to bridge the nexus between public-issue awareness and the decision-making process of public authorities. The alternative is for those authorities to continue to rely on questionable, and relatively raw, political activism as a primary form of social feedback (Eckersley 1992). The process also has the potential to clarify just what role people play – consumer or citizen – when they are confronted with an issue that may have significant geographic and temporal implications. Information flow can also be enhanced in the values jury process. Because participants are present in a jury setting over an extended period of time, they have a greater capacity to seek clarification and further information as the need arises.

The values jury concept appears to offer significant advantages over more traditional methods of determining the magnitude of aggregated values. The purpose of eliciting those values is typically for input into analyses involving CBA. They may also stand alone in cases where a one-shot answer is required. In whichever form they are used, the ultimate purpose of determining them is for input into democratic decision-making processes as a fair reflection of the values held by the impacted community. The most important operational principles under which the efficacy of a method such as the values jury should be evaluated are that it must be pragmatic (including cost-effective), eclectic, versatile and simple to execute. Even more fundamental is the requirement that the technique attains the level of accuracy and efficacy that it is claimed to achieve. There is a *prima facie* case that the values jury approach has the capacity to satisfy these principles.

## 2 MEASURING VALUES

### 2.1 Private preferences and public values

Regardless of how public goods are provided, decisions about their fair and equitable use regularly confront authorities. In the latter half of the twentieth century welfare-based economic theory has offered a considerable contribution to such decision-making processes. The most difficult task facing economists is to devise some means of translating the diverse preferences associated with such goods into a set of unifying collective preferences. It is precisely because economics has become the dominant discourse of the social sciences and the model for explaining almost all processes of social action (Hirst 1994, Udehn 1996) that it is difficult to avoid reviewing the measurement of values without considering the contribution offered by economic theory.

Prior to reviewing the role of economics in public choice issues, the contribution of two particularly significant theorists deserves identification. Schumpeter (1942, 1954) severely criticised the classical doctrine of democracy for being naïve and unrealistic. Politics and public decision-making, he claimed, were not sound forms of expression of the general will of the public because people in authority do not necessarily seek the common good. He suggested instead, that the democratic method is an institutional arrangement for arriving at political decisions in which people acquire the power to make decisions on behalf of a constituency by means of a competitive struggle for the public's vote.

In fact, Schumpeter may have been more forgiving of the role of politicking in public decision-making had he written his comments any time after the mid-1960's. It was around this time that claims for civil rights were supplemented by demands that governments and public authorities acknowledge people's rights to certain substantive conditions of life (Birnbaum, Lively and Parry 1978). Citizens began to demand that they should be more than inert recipients of government protection or assistance, and that they should also be participants in the act of shaping administrative processes by which the broader community would benefit. In response, authorities in most Westernised societies have capitulated to varying degrees by implementing a range of citizen-based consultative processes in an attempt to incorporate the views of the public. At worst, the procedures are aimed at placating. At best, they represent genuine attempts to involve stakeholders in the public management process.

The other major contributor to social collective choice theory was Arrow (1951, 1963). His conclusions, unlike Schumpeter's, have remained troublesome to public choice theorists

(Mueller, Tollison and Willett 1993, Udehn 1996) and provide a particular challenge for any research into methods for aggregating individual preferences into a collective choice. In particular, Arrow's 'general possibility theorem' contends that there are logical barriers to aggregating individual's preference orderings into a social preference ordering.

'If we exclude the possibility of interpersonal comparisons of utility, then the only methods of passing from individual tastes to social preferences which will be satisfactory and which will be defined for a wide range of sets of individual orderings are either imposed or dictatorial' (Arrow 1951 p59).

In other words, Arrow asserts that there are no non-dictatorial ways of aggregating individual preferences into a general will or a general social choice. The premise upon which this is based is his condition of 'independence of irrelevant alternatives'. This condition essentially eliminates any choice procedure in which cardinality or cardinal utility is involved. Re-stated, Arrow showed that concepts of cardinal utility and interpersonal comparisons of utility were largely meaningless. In essence, it is theoretically impossible for one person's measure of utility or value to be aggregated with that of other's because there is no objective way to assure that the relative scales of intensity are meaningful. Abrams (1980) sums the problem up neatly in this way:

'Within a certain limited range, money is not a bad cardinal indicator of preference. So long as we are comparing purchasable items within our income bracket, money is probably satisfactory...(But) the problem with using money as a cardinal indicator of preference is that it does not allow meaningful comparisons between individuals. The reason for this is that the amount of money I am willing to spend on an item is heavily influenced by my income and not simply by my preferences...(So) how can we express our preferences for items which we cannot afford?' (Abrams 1980 p78).

The dilemma for economists is yet to be fully resolved. For this reason, ordinal measures have been favoured in economic theory. But this has provided little comfort for those seeking to incorporate comparable metrics into cost-benefit analyses (CBA). CBA, as an example of the applied side of modern welfare economics, attempts to find ways of placing monetary values on the gains and losses caused to those affected by a change in the level of provision of a public good (Nas 1996). This allows a calculation of net gain from a policy change. Unlike the more common financial analysis (FA), which is used primarily in the private sector to determine a preferred outcome from the perspective of private interests, valuation in CBA is determined with prices corrected for possible market distortions. Those distortions generally result in the

condition of ‘market failure’. To date, there has been strong support for the argument that, in the absence of direct market intelligence, contingent valuation (CV) techniques provide the most effective means by which to assess the twin criteria of equity, and economic efficiency, for inclusion into CBAs (Mitchell and Carson 1989 p21). But CV is also subject to considerable criticism (for example, Diamond and Hausman 1994, Fisher 1996, Kahneman and Knetsch 1992) for characteristics ranging from validity and reliability, through to inherent bias (Schuman 1996). It is also subject to the limitations of accurate inter-personal measurement of values revealed in Arrow’s theory. Despite all, of this a more robust and practical model for determining (axiological) values is yet to emerge (Pearce 1993).

It is beyond the scope of this thesis to attempt a re-construction of CV methodology. Instead, the issues associated with the perceived limitations of CV will be reviewed in an attempt to ensure that the adaptation of the standard model used in the present study is recognised as a legitimate application of the technique. As part of this process, it is appropriate to firstly consider the larger economic context from which the study of individual’s preferences for public goods has evolved.

#### 2.1.1 Value at the margin

Following Smith, the attention of economists in the early part of the nineteenth century shifted from cost and supply as determinants of price to desire and demand. This development grew out of efforts to solve the intractable question of why the most useful things, like water, had a small or negligible price. Escaping Smith’s unresolved question of value in use and value in exchange became a major preoccupation of economists.

Walras (1831, cited in Galbraith 1989) attempted to deal with the problem. He accepted that cost was a source of value, and to this he added usefulness or utility. In addition, he believed that a product needed to be scarce to have value. Utility *and* scarcity was something that water usually lacked. Although this went part way in answering the question of value, it was later in the century that the role of marginal, not general utility, was recognised. As Galbraith (1989) describes it,

‘...it is not the total satisfaction from the possession and use of a product (or service) that gives it value; it is the satisfaction or enjoyment – the utility – from the last...addition to one’s consumption that so serves’ (Galbraith 1989 p108).

In other words, the utility of any good or service diminishes, *ceteris paribus*, with increasing availability and it is the utility of the last – the marginal unit – that sets the value of all. From this marginal utility to buyers comes the collectively reduced willingness to pay. Thus was born the downward sloping demand curve. Similarly, the more that is sought, the more that must be paid; thus the ascending supply curve. At the intersection of the two curves the price is established. This ‘equilibrium price’ is the one necessary to induce supply at the rate that the least urgent need commands. It identifies, according to welfare economics, the socially optimum level of production and price. But it has its exceptions. Monopoly established itself as the single greatest flaw in an otherwise admirable system. Under conditions of monopoly, supply and price can be imposed on the market, and this is far from a benign condition. Monopoly is a source of economic inefficiency. The means by which a monopoly is constrained are regulation and imposition of economic instruments such as taxation, or sometimes – if a degree of good faith is present - bargaining and suasion. But monopoly is not the only anomaly. The presence of ‘externalities’ and ‘public goods’ also creates difficulties within the general equilibrium model.

### 2.1.2 Externalities and public goods

Externalities are costs (or sometimes benefits) that accrue to parties other than those directly associated with an action. When externalities are present, the price of a good or service does not necessarily reflect its socially optimum value and the market is ‘inefficient’. Similarly, public goods represent an anomaly that the market has trouble dealing with. Public goods have two distinctive characteristics: nondiminishability (one person’s use does not reduce the amount available to others) and nonexcludability (it is impossible to prohibit other people’s use of the good, for example). Therefore it is difficult or impossible to charge individuals for the use of the good.

To determine the efficient level of provision of a public good requires people who potentially benefit from its existence to nominate how much each of them values an additional unit of its output. The marginal benefit is obtained by adding the values for all people who enjoy the good. The marginal cost of production must then be determined. The efficient amount is the one at which the marginal benefit is equal to the marginal cost. This occurs at the intersection of the demand and marginal cost curves.

One major problem with this approach is that people can act as *free riders* and deliberately misstate their values so that they can enjoy the benefit without actually having to pay for it. With public goods, the presence of free riders makes it difficult or impossible for markets to provide

public goods efficiently. The usual means to overcome the problem is for public goods production to be regulated, subsidised, taxed, or simply provided by governments.

A similar range of options is applicable to externalities. To the extent that most externalities raising public concerns are negative ones, the traditional approach follows that advocated by Pigou (1932), who saw the most appropriate solution as being to tax them. Pigouvian taxes make intuitive sense but under certain circumstances their level of imposition may be so great as to eliminate not only the externality but also any benefit that may have otherwise arisen from the activity that was causing them. More novel forms of 'tax' have evolved in the meantime including imposts on producers of externalities in the form of economic instruments such as emission fees, tradeable permits, and financial enforcement incentives (see, for example, Industry Commission 1997). These encumbrances are either levied on existing property rights or they create them (in the case of tradeable permits). When an externality is taxed in this way the producer is forced to internalise the cost and, at least in theory, an economically efficient allocation of resources can be achieved. Coase (1960) identified another alternative that has gained favour in recent years. Economic efficiency can be achieved without government intervention when the externality affects relatively few parties and when property rights are well defined. Under these circumstances the *Coase Theorem* may be applied: when parties can bargain without cost and to their mutual advantage, the resulting outcome will be efficient, regardless of how the property rights are specified. The obvious exception to the neatness of this honorable endeavour is when parties adopt a *strategic behaviour* pattern and one party demands a larger share, refusing to yield, and assumes incorrectly that the other party will eventually concede. Under these circumstances the only recourse available to the injured party may be to pursue a legal (judicial) alternative such as suing for damages.

In many cases the fate of public goods rests in the hands of private asset holders. For example, a historic house holding public cultural value may be subject to the unfettered use of its owner. Any change to its appearance, structural integrity or character may have a considerable impact on those who, though not owning it, obtain satisfaction from its existence. A change, such as its demolition, may create a significant externality impacting on those who suffer a loss from its demise. The visual spectre created by the mere existence of the house represents that which is associated with a genuine public good. That is, one person's viewing of it does not reduce the amount of the good (nondiminisability), and a person's observation of it has little capacity to limit someone else's viewing (nonexcludability). As such, each person can consume as much of the view as is available without excluding anyone else from consuming the same amount. It is on this basis that private parties often - sometimes unwittingly - become the holder or provider of public goods. Regardless of the property rights attached to the feature, it may provide the

public with a considerable benefit as long as it is maintained in sound condition. It is when the good is damaged (deliberately or otherwise) or destroyed that a negative externality can be created and – at least in theory – public compensation sought. At present in Australia, that compensation is only accessible by recourse to legal procedures when the owner deliberately harms the asset in contravention of a statutory requirement. For example, by wilful demolition of a building listed by the Heritage Commission. Otherwise the public interest is seldom recognised or quantified (Lane 1997, Nankervis 1997).

An additional feature of public goods follows on from their nonexcludability characteristic. If availability of the good can not be reasonably denied, then the cost of providing the good to an extra consumer is zero. In other words, public goods tend to have zero marginal costs. This, coincidentally, is a characteristic public goods share with preference-based axiological value systems. Because value at the margin determines all values for a good, the market price of a public good is therefore usually zero. On a typical supply-and-demand set of axes, the supply (marginal cost) curve overlays the horizontal axis and does not rise into the quadrant at all. This presents a pricing problem and is one of the reasons that public goods are subject to market failure. The other reason is associated with the existence of free riders. With public goods, for example, that are the gifts of nature, the zero price condition can prompt excessive use resulting in depletion and deterioration. So, industrial pollution was for a long time readily emitted into the atmosphere and waterways because they were perceived as free receptacles. Additionally, because it is difficult to demonstrate a true demand curve for a public good, people tend to misrepresent their value of it and expect to have it provided for free: thus, they become free riders. Not surprisingly, the valuation of public goods and, in particular, environmental goods, has become one of the major challenges to welfare economics. Just as unsurprising, many of these goods appear to demonstrate magnitudes of axiological value at variance with their potential market value. The emergence of a politically strong pro-environmental lobby coupled with the spread of environmental activism in the past three decades provides tangible evidence of the evolution of a widespread ethic toward such public goods (see, for example, Frawley 1994).

### 2.1.3 Values and the environment

For much of the history of trade and commerce the environment had been treated as a free public good or simply as a convenient sink for the less desirable externalities of human activity. In economics, it was not until the evolution of welfare-based analysis that it began to acquire a higher status considered deserving of the attention of economic theory. The passion and strength with which advocates have fought to claim a place for the environment in both public

and private decision-making in the past three decades indicates that its value in use had been largely overlooked, or at least underestimated, for too long. As Walker (1994) points out,

‘...environmental problems are almost always about common goods, and frequently about the stresses placed on them by scarcity, congestion and competition. They are difficult to deal with by mechanisms such as the market, and intractable subjects for bargaining and horse-trading. The collective nature of environmental problems, together with the fact that they are fundamental, means that they inevitably entail making choices, and that those choices are interdependent: collective or social choices’ (Walker 1994 p vii).

Ultimately, the key means by which most social choices are made are associated with legal, economic and political rationales. Science, for example, is deliberately excluded from this list. Even scientific revelation of itself, has not been adequate to halt environment-impacting activity: science is simply an input into the decision-making process, not a means of resolving issues. Alternatively, legal rationality represents conformity with an established set of rules. Although the Law has the broad capacity to create precedents by case-specific decisions, it is generally confined to making judgements based on existing statutes. In other words, the Law tends to uphold a pre-existing framework for decision-making. Therefore it may have little to add to the resolution of choice decisions other than by enforcing codes that have been generated by the political process. Economic rationale has aided policy-makers in a much more fundamental way than have legal processes. It is precisely because economics has promised the greatest potential for providing compatible metrics that it has come to dominate the language of decision-making (Adams 1993). The central problem of economics though, is that of comparability and commensurability. The plurality of values that can be associated with any environmental feature has presented economics with the greatest challenge of refining a system by which *prima facie* diverse goods can be compared by a unifying metric. The presence of non-market, non-use values, and externalities has stimulated economic thinking to pursue means by which a common metric can be adopted to account for factors not otherwise readily identified by price signals in the market. The problem of incommensurability in environmental values is a particularly pervasive one simply because of the broad range of values to be taken into account (see, for example, Beckerman and Pasek 1997). Ultimately, the preferred metric is a nation’s currency (\$AUD, \$US, etc.). The reason for this is the dominance of cost-benefit analysis (CBA) in welfare economics.



If an environmental feature suffers due to a particular activity, the 'loss' should be accounted for to ensure that it is represented in the cost side of the CBA equation. Similarly, any benefit must also be identified to ensure that potential for corruption of the CBA decision philosophy does not occur. The critical weakness of CBA is that unless all costs and benefits are considered, then the analysis will be faulty. Notwithstanding this, a large amount of information about the magnitude of costs and benefits is provided by market-based price signals, and it is the relative ease with which this can be accrued that favours the consistent use of currencies as the preferred form of measurement. Debates continue about how to genuinely account for value characteristics that are not subject to such ease of capture. Contingent valuation and its variants have – albeit imperfectly – filled this role in many cases, but there is an obvious underlying dissatisfaction with these methods. Ultimately, the purpose of identifying the scale of values associated with any environmental feature is to ensure that political decisions made about the feature are based on the accumulation of as much information as is possible for a fair assessment of the impact of the activity in question. It is, after all, the political rationale that will generally prevail as the dominant framework for resolution of environmental disputes; all other rationales tend to merely act as inputs into this activity.

A particular example of the limitations of CBA to environmental issues is worthy of note. It concerns the matter of discounting future costs and benefits. Cost-benefit analysis relies on costs and benefits being reduced to a common unit so that they can be compared. A central tenet of economic theory is that people value a dollar today more than the same dollar at some time in the future. For this reason costs and benefits that accrue in the future must be discounted at an appropriate rate to provide a common measure in today's terms. The discounting of future costs and benefits has generated much debate (Cline 1992, Nordhaus 1994). Some argue against discounting, claiming that current and future generations should be treated equally (Cox and Waring 1992). However, using a zero discount rate implies reducing current consumption to subsistence levels in order to reap the gains in future consumption generated by the compound interest on savings (Chisolm 1988).

There are two common approaches to determining the appropriate discount rate for use in CBA. One is the opportunity cost approach that is based on the rate of return that could be achieved by investing in some activity other than the one being evaluated. This method is soundly supported by economic theory but has difficulty in dealing with public amenity assets – including features of the environment – because of their potentially large non-use value component. The second, is to use a social rate of time preference, which is based on the degree to which individuals are willing to trade-off reductions in current consumption for future gains.

The trade-off may be in the form of forgone income (or 'in kind') benefits. Alternatively, it may be registered in something like a donation strategy along the lines of 'how much would you be willing to donate (and therefore forgo some personal consumption potential) to save/maintain/develop this feature of the environment?'. Such a statement is very similar to standard CV questions.

From an empirical point of view the major difficulty in determining an appropriate discount rate for public amenity goods is that net present values (NPV) are usually unknown. If they were, then the stream of net benefits could be used to determine the discount rate applying to the particular project. Of course there would be little need to determine the discount rate if the NPV was already known, but similar project appraisals may be enhanced by a 'benefit transfer' capacity. In other words, if the NPV and the value of the per-annum stream of net benefits were known – assuming they exist for an extended period or, more appropriately, in perpetuity – then the discount rate could be established.

Unfortunately, to date there has been no substantive method for determining the NPV of non-market values apart from applying discounting estimates to CV responses. The problem of finding the appropriate discount factor remains. It is one of the objectives of this study to demonstrate a novel method of determining a social discount rate from the intensity of preferences that people hold.

More broadly, the continuing ruling philosophy guiding estimates of environmental values (that are not expressly revealed by the market) is summed up by Pearce (1993):

'The economic value of something is measured by the summation of many individuals' willingness to pay for it. In turn, this willingness to pay (WTP) reflects individuals' preferences for the goods in question. So economic valuation in the environmental context is about 'measuring the preferences' of people for an environmental good or against an environmental bad' (Pearce 1993 p13).

The presumption behind the willingness-to-pay (WTP) theory is that where consumer preferences cannot be directly revealed by the market, then they can be deduced by alternatives such as 'stated preference' techniques. That the two are somehow equivalent and demonstrate an equality in magnitude has been widely debated in the literature (for example, Winpenny 1991). Despite this, the advocates of cost-benefit analysis (CBA) have been keen to incorporate the outcome of WTP analyses into their work. This implies that they have accepted both stated-

preference and revealed preference WTP estimates as reliable indicators of value. This is despite the fact that non-market values are not easily identified using currently favoured methods. In addition to non-market values, authorities are increasingly concerned with identifying the level of so-called non-use values. That is, values associated with mere existence of an environmental feature rather than its use (utility) value. These may include – but are not limited to – intrinsic value, bequest value, vicarious use value, aesthetic value and benevolence value: all more closely aligned and identified with axiological values than purely market driven ones. Goods holding these values are typically not traded in the market and the magnitude of their (market *and* axiological) value can vary considerably dependent largely on the strength of preference of the particular valuer. Regardless of this, for those who suffer the impact of the loss of the good it may represent a considerable reduction in their welfare. WTP estimates under these circumstances appear totally inappropriate. As Bromley (1995) points out,

‘When a choice situation holds the promise of welfare gain, it seems obvious that one should estimate the monetary value of the welfare gain by asking what individuals would be willing to pay to experience the welfare gain... Similarly, when faced with a welfare loss, there is a certain intuition to an approach that seeks to estimate what might be required by way of compensation to make that person whole. The difference in which approach – WTP or WTA – is followed is not trivial in terms of empirical estimates of monetary valuation’ (Bromley 1995 p132).

#### 2.1.4 Willingness-to-pay *versus* willingness-to-accept

Economic theory in general and consumer preference theory in particular, supports the hegemony of the WTP method. This is principally because the question framing is intended to determine the impacted party’s willingness to pay to receive a public benefit or, to avoid a public loss. That the two are the same is subject to contention. After all, ‘the economic value of something is how much someone is willing to pay for it or, if he has it already how much money he demands to part with it’ (Posner 1986 p11). Loss to an owner or interested party is more typically reflected in an estimate of compensation. But because ‘compensation’ carries overtones of excessiveness and unreliability, the more conservative estimate of value by way of WTP estimates has become common practice (Fisher 1996, Haneman 1996). The continuing debate about WTP versus WTA has serious consequences for CV and similar valuation models. Until significant empirical evidence emerged, the common view was that, ‘for many goods, services and amenities that command a fraction of the consumer’s budget, the differences between [WTP and WTA]...measures are trivial’ (Randall 1987 p244). But, according to Knetsch (1994 p352), the findings from essentially all tests of equivalence show that people

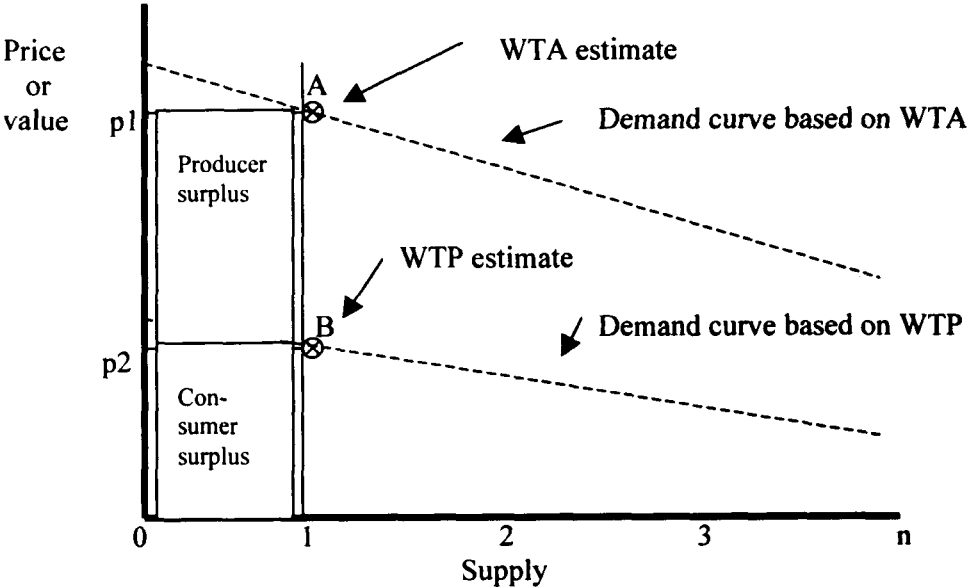
commonly value losses much more than objectively commensurate gains. Tversky and Kahneman (1981) describe this as people holding an asymmetric value function. That is, people treat gains and losses disproportionately, giving the latter much heavier weight in their decisions than the former. Milgrom (1993 p429) suggested that ‘the precise magnitudes vary across studies, but ratios of four to fifteen times are not uncommon.’ Ward and Duffield (1992) provide an illustration of this when they found that respondents to a CV survey were willing to pay only \$3.50 each to preclude the need for a dam (thus saving a scenic waterfall), but demanded \$22.00 to accept the loss of the waterfall should the dam be built.

Despite the intuitively acceptable principle that losses are appropriately valued by the WTA measure, environmental losses are almost invariably valued in practice by the WTP measure (Knetsch 1994). The reason for this appears to be an essentially pragmatic one: WTP is constrained by the capacity of the individual’s budget, whereas WTA can be an indefinite amount because it represents a measure of compensation. This lack of a budget constraint in measurements of people’s WTA is a characteristic shared with the estimates of axiological values. As an influential body in the international field of environmental damage assessment, the United States’ National Oceanic and Atmospheric Administration (NOAA) has issued notification of its opinion about the debate. Its position (NOAA 1993 p4603) is largely unequivocal: WTP measures should be used to value losses because they provide a ‘conservative choice’. Implied in this is a suspicion that people will assume a monopolistic role if asked to identify the extent of their personal loss. That is, they are suspected of seeking out an exaggerated reservation price for their loss, especially under circumstances where the good is relatively unique or has limited capacity for substitution. So, with a strong incentive for the public to nominate an inflated indifference value, authorities such as the NOAA find the ‘conservative choice’ the most appealing one.

Although WTA measures may present opportunities for the over-statement of loss, the continued near-universal acceptance of WTP estimates in CBA analyses has the perverse potential to seriously underestimate values. This is despite the fact that the principles of compensation specify that the magnitude of a loss is the value to the owner, not the value to the acquirer. In most cases the environmental loss accrues to more than one party, particularly where the feature is held in trust for the benefit of the public by a statutory body such as a Local Government authority. In these cases it is not the loss to the governing authority that is so important as is the loss to the people on whose behalf the environmental asset is held. In many ways, the controlling authority is simply the identifiable trustee for the goods. The goods are usually considered to have a collective – albeit anthropocentric – nature.

It should also be recognised that public authorities are not the only providers (or holders) of public goods. Private agents (individuals and corporates) can also control such goods although often they are acquired or divested without their non-use values necessarily being identified in the market. In these cases the public is dependent on statutory limitations for their interests to be identified and respected. Heritage listing control on re-development is one example. In many cases, the public's interest is subject to the pure benevolence of the holder of the goods. Under these circumstances the public can only hope that good stewardship prevails. But this should not preclude the public from identifying a level of interest in, and affinity with the subject goods. Rather, in these conditions it is precisely because the public are at risk of losing a stake in the goods that WTA stands out as the most appropriate postulate upon which the value to the broader community should be based.

The polarity of difference between WTP and WTA estimates highlights another perpetual problem in environmental economics. In addition to the absence of a cost-based supply curve for most public goods, the generally unique nature of the goods results in a fixed supply. In many cases the rate of supply will be a single unit, never to be provided again. Such is the case with an unequalled aspect of a landscape, or a peerless example of a particular building style. Under these conditions the estimation of WTP is often in sharp contrast to any measure of WTA (Figure 1).



**Figure 1.** *WTA versus WTP demand curves when the supply of a good is fixed at a single unit.* (For an example of this refer to Ward and Duffield 1992).

Accepting the WTP measure when a degree of uniqueness is a feature of the good provides a more conservative estimate of value and is likely to appeal as the preferred option for most authorities in favour of development. Conversely, if the impacted stakeholders have identified a much higher WTA, development potential may be considerably constrained. An inherent problem in all of this is that because of the uniqueness of the environmental asset, a condition of natural monopoly exists. According to economic theory, when exchange takes place voluntarily, it is generally assumed that it makes all participants better off. The economic measurement of the extent to which buyers benefit from the transaction is known as *consumer surplus*. Economic reasoning suggests that a voluntary exchange will take place between a buyer and a seller if, and only if, that exchange makes both parties better off. On the buyer's side, it is assumed that willingness to exchange depends on her expectations of receiving consumer surplus from the transaction. A similar expectation is assumed to exist on behalf of the seller who only participates in the transaction if a *producer surplus* is evident.

It may be argued that under conditions of monopoly – natural or otherwise – those having a defined interest in the unique environmental asset can hold out for an extravagant reservation price, resulting in the entire potential surplus accruing to the 'producer'. In figure 1, this equates to the area  $0, p_1, A, 1$ . It is on this basis that the rights of ownership are expected to be fully vested in the parties who are asked to reveal their WTA and that no other interests prevail. The marginal cost of production in this case is understood to be zero, resulting in a single supply curve running parallel to the vertical axis. In this case, the 'consumer' pays the full marginal cost to acquire the asset, with no attendant surplus evident. On this basis, the entire surplus accrues as an economic benefit to the producer. Under most conditions where an environmental good is involved the 'producer' will simply be the party holding the existing use rights.

Alternatively, if it is believed that those holding the existing rights of use in the asset should be questioned to reveal their WTP to avoid the loss of the feature – and of those rights - then instead, all of the surplus benefit accrues as consumer surplus (area  $0, p_2, B, 1$ ) to the acquirer. Note that the price actually paid by the acquirer to achieve a consumer surplus is much less than that expected by the existing owners if the agreed transaction price is based solely on the price that the owner demanded to participate in the exchange. The apparently excessive economic benefit accruing to the sellers (indicated by the area  $p_2, p_1, A, B$ ) is one reason that economists argue in favour of using WTP strategies to determine the magnitude of value. The claim that excessiveness is evident results automatically from the condition that the seller has a monopoly.

The typical economic response is a resort to the options of state-ownership, regulation, or other externally-administered measures to control the conditions of monopoly. Under the

circumstances where the two parties to the transaction appear to act strategically, believing the other will succumb to the pressure to compromise (or capitulate), then the two values A and B will remain indications of entrenched positions. It is more likely that a position somewhere between the two points will provide the parties with a compromise they are both – to an extent – satisfied with. Economic reasoning has little to say about the point at which this compromise is likely to occur apart from asserting that if, according to Coase's logic, the parties negotiate costlessly, then the outcome will be economically efficient anyway. Ultimately, the essential issue appears to be one of what each party brings to the negotiation process as their initial endowments. In other words, the basis for compromise is bound strongly to the rights that each party holds at the commencement of the transaction process. If public amenity rights exist – either in statute, or by custom – then asking the public for their measure of WTA appears the fair and equitable question upon which to estimate environmental value. If instead, the right to acquire environmentally sensitive sites is seen to be one vested solely in the hands of the intending purchaser, then it appears that it is the public's WTP to defeat the bid by the purchaser that should act as the more appropriate measure of value. In either case, the pivotal role of the rights attaching to an environmental asset cannot be avoided as a fundamental issue. Just what form the rights take and who holds them is critical in determining the outcome of the process.

Much of the environmental valuation work commissioned throughout the world in recent years has been completed using the model guidelines prepared by the NOAA. In the United States the NOAA and the Department of the Interior (DOI) are charged with writing administrative rules that give various environmental legislative mandates their operational content. The DOI recommended that environmental damages be estimated as the necessary costs for 'restoration, rehabilitation, replacement, and/or acquisition of equivalent resources' plus 'compensable value' (Federal Register 1992 p19771). Compensable value is defined as the 'amount of money required to compensate the public for the loss in services provided by the injured resources'. This appears to suggest that inclusion of so-called non-use values into the estimate of total value is appropriate. In doing so it offers little technical support for the proposition that WTP measures are the appropriate ones to identify the total value of the environmental loss for the estimation of the compensable value. In all of this, WTA appears the more appropriate measure. To suggest that WTP estimates represent a fair indication of the magnitude of stakeholder values is also to deny the existence of axiological values. WTP estimates rely on the assumption of a budget constraint. WTA and the expression of axiological values are not subject to the same constraint. For this reason, WTP estimates are unlikely to reflect a true impression of the magnitude of people's held and symbolic values toward a particular feature of the environment.

Because WTA is based on compensation for loss, some mention should be made of the underlying principles at issue in relation to the market and commercial reality. These principles are applicable to the loss of all types of assets and interests. The laws of real estate commerce in Australia provide a useful example:

‘...the amount of compensation to which a person is entitled is an amount that, having regard to all relevant matters, will justly compensate the person for [their loss]... It is well established that the dispossessed owner is entitled to not only market value of the land but its value to the owner. All acquisition statutes now compel the inclusion of value to the owner even if not expressly described as “special value”... The test generally applied is that what a prudent person would be willing to give for the land above its market value rather than fail to obtain it’ (Hemmings 1997 p434).

The ‘prudent person’ test implies that it is the value to the dispossessed interested parties that is the overriding determinant of value in such cases and not the market value. This is also known as the seller’s ‘reservation price’. That is, the price at which the seller is indifferent between retaining the asset and forgoing it. Although not expressly provided for in any compulsory acquisition statutes in Australia, the courts often use their discretion in awarding a component of compensation called ‘solatium’. This is, in effect, a sum of money paid to a dispossessed owner over and above the actual damages as solace for injured feelings (Hyam 1995 p264). The purpose of drawing on the example of real estate practice in Australia is to highlight the fact that asking the owner’s willingness to pay to avoid a loss of amenity is *not* a principle of commercial activity. It is likewise difficult to recognise it as the appropriate measure of value even for non-market goods. Solatium is recognised in commerce and must be considered an essential element of the determination of a reservation price. It is the reservation price – equivalent to an owner’s WTA – that is fundamental to the estimation of value, and not simply the WTP bid price. Even more fundamental, assessing the seller’s WTP under these circumstances appears to add little to the objective of determining the magnitude of value of the asset, particularly because of the confusion resulting from the confounding of the ownership rights associated with the asset.

Although contention surrounds the practice of stated preference research, the WTP versus WTA argument is also subject to a much more fundamental problem. As Winpenny (1991 p60) points out, ‘there is a large asymmetry between WTP and WTA, for which economic theory does not prepare us’. Although such a statement appears to be almost innocuous – and identified with Tversky and Kahneman’s asymmetric value function – it raises a much more important issue as to how WTP has come to prevail in contemporary economic logic. To understand the reason for



this it is important to review the epistemological basis for believing that WTP should hold its position of general hegemony over WTA.

#### 2.1.5 The epistemology of value

In the history of epistemology there have been two main schools of thought about what constitutes the primary means to knowledge. One is the 'rationalist' school, which holds that reason plays this role. The paradigm of knowledge for rationalists is principally logic, where 'truths' are arrived at by intuition and rational inference. The other is the 'empiricist' school which holds that knowledge is accumulated by observation and experimentation (Grayling 1996). It is this school of thought that has come to dominate in the natural sciences as well as the various fields of economic research.

Generally, what justifies an empirical belief is that it can be inferred from some other belief which is already justified. The problem with this though, is that justification can become a seemingly endless retreat into sequencing which, in the extreme, may lead to the sceptical conclusion that no empirical belief can be ultimately justified (Bonjour 1985 p xi). The standard solution to this problem is *foundationalism*. This view holds that certain empirical beliefs can be justified in a way which somehow does not depend on inference from previous beliefs. In many ways this view is supported by the widely referenced claim by Kuhn (1962) that the history of empirical research shows a periodic revolutionary overthrow of previous conceptions of reality rather than a gradual and steady accumulation of knowledge. While this may have a degree of veracity in the physical sciences, in the social sciences there is much less evidence of it occurring. One possible exception is that of marginal analysis in economics. The 'marginal revolution' commenced with the work of Jevons and Walras in the mid-nineteenth century. According to Ormerod (1994),

'The theory introduced by the marginal revolution was based upon a series of postulates about human behaviour and the workings of the economy. It was very much an experiment in pure thought, with little empirical rationalisation of the assumptions....The key concept for the individual introduced by marginal economics was that of marginal utility. This theory did not spring fully fledged from the works of Jevons and Walras, but was developed gradually during the final decades of the nineteenth century' (Ormerod 1994 p48).

The theory of marginal economics has remained remarkably resilient and continues to dominate economics texts. Although the foundational belief in the efficacy of marginal economic

analysis dates back to only the mid-nineteenth century, it is now difficult to envisage any further development of economic theories that may have prevailed prior to that time. Instead, the continuing hegemony of marginal economic analysis is now the cornerstone for the development of increasingly refined economic theories that rely heavily on such analysis for their coherence. In a fundamental way, once a 'revolution' in knowledge has occurred it is usual for the work that follows it to obey some form of coherent policy. That is, the work that springs from the foundational change will usually only need to be coherent with the change to establish its own justification. Such is the case with the theoretical constructions that underpin WTP, WTA, contingent valuation, and cost-benefit analysis.

It is pertinent to note that in economic analysis under conditions where no market exists, WTP has become the dominant measure by which the value of a feature has come to be determined. Although this is not unexpected from an applied economics point of view, it is not altogether clear that WTP should be invoked in almost every situation concerning the valuation of public amenity. Davis's (1963, cited in Mitchell and Carson 1989) CV study of environmental amenity remains a reasonably recent contribution to the assessment of 'value' in an environmental context and yet it is also generally acknowledged as the seminal work in the area. Many texts now also refer to the milestone work of Mitchell and Carson (1989) in justifying various validity claims about the use of CV and, in particular, the preferential use of WTP. In spite of the fact that Davis acknowledged that his new method - in the WTP form that he applied it - 'had some rough spots', it became widely referenced as the first major contribution to CV analysis. The CV method gained greater credibility when it was adopted into legislation in the United States as a preferred method for estimating environmental values in the absence of a clearly defined market. The legislation tended to encourage WTP estimates over those of WTA. This was because it almost always represents a conservative estimate of value, and is therefore considered to be more pragmatic. Even the work of Mitchell and Carson is used by some researchers in the CV field to justify the continued use of WTP estimates over those of WTA. They demonstrate CV's theoretical coherence as being derived from, and therefore justified by, neo-classical economics. But in the absence of being able to effectively justify WTA, they default to a preference for WTP. Thus they claim that,

'We believe that although it may be possible to design successful WTA contingent valuation questions in some situations...the task is not an easy one' (Mitchell and Carson 1989 p37).

Such a shallow justification has remained unquestioned by many environmental valuation researchers. As a result of this and the justification afforded by the U.S. political

encouragement, CV has come to be dominated by WTP measures. But, as Mitchell and Carson go on to suggest, the use of WTP or WTA estimates of value is ultimately dependent on the rights of access and use held by the actual valuers. On this basis, they confirm one particular finding that has significant implications for environmental valuation research, namely: many respondents use a CV survey as a means of registering their 'vote' for or against a particular environment-impacting action. It is this referendum-style answer that tends to confound the results of CV surveys. In other words, metrics (usually \$-based numbers) become confused with (yes/no) votes. Nevertheless, if the strength of this vote could be captured it should represent the actual measure of people's valuation of the environmental feature. It is for this reason that Mitchell and Carson find that CV surveys which adopt a referendum-style format have the greatest possibility of capturing the true measure of value by way of a WTA measurement. In fact, they conclude that,

'In our view, the appropriate model for CV surveys of pure public goods...is the referendum, by which citizens make binding decisions about the provision of public goods. From this perspective, instead of falling short of the relevant market model, well-conducted CV surveys offer significant improvements over actual referenda as a means of measuring consumer preference' (Mitchell and Carson 1989 p296).

On this basis it would appear that many researchers have simply overlooked the finer detail in Mitchell and Carson's work and opted for the application of CV on a WTP non-referendum basis despite the implied encouragement of the authors to broaden the application of the valuation method. Additional encouragement follows on from the work of Stiglitz (1977). Mitchell and Carson (1989 p303) suggest one novel and important area of investigation to which CV-type exercises are likely to be appropriate is that of valuing 'local public goods'. These goods, they suggest, include such features as city parks, museums and so on, to which they concur with Stiglitz that the CV referendum model would be particularly suited.

On the basis of the justification for a broadening of thinking about CV-type methods offered by Mitchell and Carson's conclusions, it is appropriate to now more closely review the position of stated preference techniques as an aid to public goods valuation research.

#### 2.1.6 Stated preference techniques

Contingent valuation (CV) has become the predominant stated preference method employed by economists to value environmental goods and services. Other stated-preference approaches with the potential capability of capturing the same information have not been applied as widely as

CV. These other methods are drawn from the domain of decision research, marketing, and transportation research. Stated preference methods involve the elicitation of responses to predefined alternatives in the form of relative values, ratings, rankings, or choice. One technique receiving considerable research attention is Choice Modelling (CM) (Boxall *et al.* 1996). This method has its origins in conjoint analysis, a well-known technique applied in marketing since the 1970's, and more recently employed in geography, transportation, and economics (Louviere 1991). CM is claimed to have a particular advantage over CV methods in that rather than questioning respondents over a single event in detail, subjects are questioned about a sample of events (for example, Morrison *et al.* 1996, Blamey *et al.* 1997). Individuals are asked to choose their preferred alternative from a 'choice set' made up of a package of various attributes. When a price or cost factor is included as an attribute in a package, CM advocates claim it is possible to estimate economic values associated with the other attributes. Although CM may show promise as a functional alternative to CV methods, its application to issues of public goods remains subject to much further research.

CV estimates of people's willingness to pay remains the main technique employed to elicit values associated with all manner of environmental loss. CV exercises typically ask respondents for estimates of their WTP to preserve an environmental feature or to avoid its loss. Economists undertaking research into the continuing efficacy of the CV approach face additional problems in that NOAA (1993) has specified a set of requirements to be met for CV survey results to be considered valid estimates of environmental value. The guidelines have generally been accepted as an internationally recognised framework. The conditions set by the NOAA include: a high response rate (at least 70 per cent), minimum sample size (1000 people), in-person interviews, and a variety of others that attempt to add validity to the CV process. The problem is that conformity with these guidelines tends to make CV surveys cumbersome, expensive to conduct, and difficult to apply to localised issues or events. What makes the process even more troublesome is that, as Smith (1996 p139) points out, 'there is still no protocol that identifies when a stated choice is guaranteed to provide a reliable basis for measuring an economic value'.

One of the more fundamental problems attendant to the use of CV surveys – and stated preference techniques in general - is that of unintended bias entering the procedure. For example, a continuing flaw in most WTP exercises is that respondent's *gross capacity to pay* is usually overlooked, or at least unaccounted for. This may have a consequent influence on the outcome of the research in the form of bias. In this case it becomes a budget constraint bias. CV practitioners often report on the potential of a range of biases to enter the analysis for various reasons (see, for example, Schulze *et al.* 1996, Bennett, Blamey and Morrison 1997).

For example, strategic bias (where respondents misrepresent their preferences by perceiving an opportunity to influence policy outcomes), hypothetical bias (where respondents believe the questioning is of a hypothetical nature and of little relevance to real-world issues), 'warm-glow' bias (where respondents gain a sense of enjoyment from the process of offering to pay to a 'good cause' rather than for the actual good being valued), and payment vehicle bias (where the instrument of bid collection is a non-neutral factor in the magnitudes of values expressed by participants), all have the capacity to undermine the credibility of WTP research. This is not an exhaustive list of potential biases that may influence the outcomes of stated preference research. Mitchell and Carson (1989) provide a more complete review of the potential impacts of bias on CV methodology (a summary of their work on biases is included in appendix 2). Overcoming bias in stated preference techniques is fundamental to assessment of efficacy. In the case of bias caused by lack of definition of people's budget limitations, there is a *prima facie* case to suggest that if the individual respondent's actual budget limitation was known then at least a portion of this bias could be accounted for. This means that rather than simply asking participants to answer WTP questions *as if* they had a budget constraint, a request to nominate their actual level of donations to public causes in say, the past year, may identify their genuine budget capacity to meet their public-good WTP preferences. Bias in CV surveys is one of the reasons that policy makers may have for viewing the outcomes of such surveys with considerable scepticism.

Much of the debate about the validity of stated-preference estimates of value arises because the market is understood to only poorly reflect the broader social values attached to many public goods. As such, 'market failure' is an inevitable characteristic associated with almost all of these goods. If the market could contend with all of the deeper social attachments that people hold, then it could be relied upon as an appropriate source of information. Even without relying solely on the market for constructive information about any particular good it is possible to use market information as the baseline upon which other values can be stacked. In other words, value-in-exchange (market value) may be perceived as a reflection of the minimum value attributable to a feature when it can be traded. Even in the absence of an ability to be traded, the value of close substitutes can often be estimated and used as proxies. For example, legislative constraints applicable to many national parks forbid the commercial sale of the land, but an estimate of their potential value-in-exchange is often possible by comparison with similar privately-held land sales in the vicinity. This is typically how governments account for the value of non-commercial landholdings on their balance sheets. Such values represent the *minimum* value of the feature to the public. The essential challenge of public-good valuation is to determine its value *in excess* of market value. After all, it is the (axiological) value to the

broader community – reflecting an awareness of the greater geographic and temporal issues at stake – that ultimately counts when public decisions have to be made.

Even where market intelligence appears to provide a fair reflection of the value of a public good an additional problem arises. The ‘market’ as such is based on the assumption that demand equals supply and that competitive equilibrium prices prevail. In principle, all prices are determined by the convergence of willingness-to-pay with willingness-to-accept sentiments. This is the criterion of valuation. It results in the so-called socially optimal allocation of resources. Importantly, this process only reflects the wishes of those actually trading in the market. That is, those who are holding endowments or those who wish to acquire them. Absent are those who are neither buyers nor sellers, including future generations. Also absent are those whose rights and interests in the good to be traded are not fully recognised. This gives rise to the problem of externalities. When externalities are present the values revealed by the market do not necessarily account for those associated interests. Externalities therefore become non-traded goods outside the market. One of the central tenets of neo-classical economics is that,

‘... free market, competitive equilibrium is efficient, in the important sense that demand equals supply in every market, so that all the resources of an economy are fully utilised, and none lie idle’ (Ormerod 1994 p71).

For externalities, the payment is often removed to some other place and possibly some other time. The geographic and temporal shift is difficult to factor into a free-market revealed price. So even if the good’s market value is ‘revealed’, in many ways it may be an incomplete reflection of the price that *should* have been paid. Externalities therefore become a cause of ‘market failure’. In all of this, questions involving ethical judgements and moral considerations are difficult to avoid.

Pearce (1993) defends a kind of social awareness in WTP and CBA estimates that is unusual for a neo-classical economics advocate.

“‘Measuring preferences’ is a clumsy phrase, but at least it tells us what economic valuation is...Economists do not ‘value the environment’. They observe that individuals have preferences for improvements in the environment and that those preferences are held with varying degrees of intensity. For over a hundred years there has been a highly developed science within economics for measuring this intensity of preference. Its practice is known as cost-benefit analysis...One of the ironies of the criticisms of this approach is that critics seem to have nothing to offer in its place’ (Pearce 1993 p ix).

The message in Pearce's defence of WTP and CBA is that the underlying purpose of their use is to determine the anthropocentric value that can lead to the optimal distribution of welfare throughout society with regard to public goods such as environmental assets. He almost pleads for the development of valid alternative methods to arrive at the same result. It is a call for the underlying ethic to be revealed in the form of a magnitude of value, or, as Prior (1998 p433), suggests, a request for the revelation of 'the kind of social formation which neo-classical theory attempts to analyse'.

The value judgement underlying preference-satisfaction philosophy is that the personal wants of individuals in society should, when aggregated, guide the use of society's resources. This, as Kneese (1977) points out, is also the premise that guides Western democratic political theory. The problem that it raises is whether the economic methods used to satisfy the democratic process – namely WTP and CBA – are adequate to correctly identify the magnitude of value and ethical commitments associated with the goods being addressed. And, in particular, whether they incorporate provision for externalities in the process. Consider, for example, a contingent valuation exercise that asks a sample of the population to place a figure on their willingness to pay for the preservation of some environmental feature. Almost all such surveys return at least some responses claiming 'infinity', or something like 'nature is too valuable to be treated like this'. These questionnaires are generally discarded on the basis of being incomplete or wrongly completed. In reality the respondent *is* providing an indication of their preference but the methodology is not equipped to deal with it. CV surveys are therefore continually being modified to deal with such conditions: not necessarily by enhancing their capacity to deal with a greater range of responses, but rather by tending to limit the number of responses available to the participants. 'Dichotomous choice', which presents 'either/or' questions, and avoidance of open-ended value questions are examples of means employed to limit the options in answering such questions.

The other major problem is that WTP assumes that an individual budget constraint exists. In other words, no-one has the capacity to pay 'infinity' and so such a bid has to be exorcised from the responses. The problem that this creates is that the 'vote' cast by this type of response is rejected and, at best, a mediocre reflection of the strength of aggregate preference prevails. The ultimate challenge for its advocates is to offer some evidence that WTP estimates – and techniques such as CV – actually measure what they claim to measure.

## 2.2 Environmental activism

While the debate about WTP *versus* WTA and the merits of stated-preference valuations continues, a situation approaching an impasse has emerged. This has provided supporters of non-economic measures an opportunity to highlight their preferred methods of controlling environmentally sensitive activities by such alternatives as Safe Minimum Standards (SMS) and Environmental Impact Assessments (EIA). Although environmental valuation practitioners are continuing to deal with fundamental valuation issues, it is clear that the determination of value *per se* is unlikely of itself to resolve many environmental conflicts. Economic values can only act as an input – a reflection of the stakeholder's magnitude of commitment to an environmental feature – into the decision-making process. This is much the same role that SMSs and EIAs may play.

The more fundamental problem that remains is whether any satisfactory collective or aggregative form of valuation can be devised that incorporates true environmental values and takes appropriate account of the magnitude of people's 'votes'. If not, then accounting for environmental values will never substitute for the liberal democratic right of protest in the form of environmental activism. Such activism remains the very public face of private citizens' environmental concerns.

Environmental activism is a form of liberalism that has gained an exceptional following in the past three decades (Frawley 1994). More broadly, liberalism in general has become a dominant ideology in the same period in most Western societies. As an overt expression of liberalism, environmentalism has, according to Paelkhe (1989 p3), 'the potential to become the first original ideological perspective to develop since the middle of the nineteenth century'. The reason for the higher profile accorded to the environment is not difficult to find. Holes in the ozone layer, changes in world weather patterns, widespread pollution, population growth and so forth, affect most societies and impact on daily livelihoods in many ways, right down to the type of foods eaten and how waste is disposed. Liberal ideals and environmentalism have permeated the psyche of Westernised culture in many ways as evidenced in the vocabulary associated with tolerance, individual rights, justice, equity, fairness, equality and democracy (Webler and Renn 1995).

Of course, a society sensitising itself to liberal ideals also has the capacity to move very quickly into a postmodernist mode and begin to question the efficacy of such lofty visions. The 'modern' view prevailing for much of the twentieth century has tended to trust that social order would be created out of rational instruments of science, technology, bureaucracy, and economic



prescription and formulation (Beckerman and Pasek 1997, Crowards 1997). In its place a more sceptical view is now emerging which is characterised by elements of relativism, pluralism, ambivalence, ambiguity and the need for contingency: the characteristics of postmodernism (Costanza, Funtowicz and Ravetz 1992). Decision-making processes are being challenged to accept, as Funtowicz and Ravetz (1991) claim, that facts are often uncertain, stakes are usually high, and conflict in values becomes the norm. It naturally leads to a questioning of the principles of governance and public accountability in decision-making. Even the fundamental ideals of democratic processes are open to revision with critics such as Brittan (1998) suggesting that the central virtue of democracy is primarily that it provides a peaceful means of removing unpopular governance. He goes on to suggest that democracy therefore does not necessarily mean we should simply construct a system based on the views of the majority of the moment. Public decision-making is in reality about political maneuvering and compromise. It seems naïve to suspect that it is clean, fair and always about equity. Trade-offs are central to all democratic processes. The need to incorporate elements of justice and sensitivity to stakeholder concerns is therefore primarily about being *seen* to be doing the right thing in the eyes of the community. But, as Walker (1994) points out,

‘The decision-makers work with partial information about the preferences of society; biases of their own; technical and scientific information which may range from comprehensive to woeful. Often they are unable to interpret the latter or to appreciate its significance, and so decisions frequently reflect ideology or prejudice rather than enlightened self-interest, altruism, or sound judgement’ (Walker 1994 p186).

That the democratic system is fallible is unquestionable. More important is whether its preferred methods of conflict resolution can translate decisions into generally fair and equitable treatment for all.

In general, the accepted approach to contending with environmental conflict is to let the legislators and administrators duel over the particular issue in question. Most importantly, what they need to arrive at their preferred point of compromise are data, evidence and feedback. An element of lobbying from particular interest groups has also seldom gone astray. High profile environmental activism has met this challenge extremely well if measured by the level of media coverage it has gained. What belies all of this is the need for basic data collection to ensure that arguments can be supported and assertions defended. SMSs and EIAs are two forms of potential input into an environmental decision-making process. Both are largely science-based. A major underlying weakness is not the strength of the science that they are premised on but rather, it is that most arguments in favour of a specific environmental activity are framed in

terms of economic benefits, not scientific ones. Arguments that compare utility on incommensurate metrics are often doomed to add fuel to uncertainties rather than assist in ameliorating them. It is clear that while other numeraire have a role to play in measuring the qualities of human environmental activities, economic ones have become the language of default. Quite simply, when trade-offs in decision-making are required, the process is enhanced by the provision of detail on a like-with-like basis. Most times this involves a need to ensure that economic data are available as a baseline assessment of the consequences of any intended action, particularly because cost-benefit analysis is now so widely used. Notwithstanding this, as Hanley (1992) points out,

‘economic values and cost-benefit analyses rarely constitute the *sole* inputs into decision-making. Information about equity, cultural and social significance are also important inputs. Political considerations also have a strong and sometimes over-riding influence on decisions’ (Hanley 1992 p38).

A challenge therefore arises: can liberal theories of justice and welfare be appropriately applied to the questions of environmentalism and, in particular, environmental valuation, in such a way as to provide decision-makers with robustly defensible data? That is, data that adequately capture the true strength of the public’s attachment to a threatened environmental feature.

Liberalism tends to concentrate on anthropocentric requirements taking into account people’s political, social and economic arrangements. Many would argue that it does this rather imperfectly because its expression is most obviously via legislative, judicial and administrative procedures that tend to favour a majority rule philosophy and so not everyone is satisfied with every outcome (Webler and Renn 1995). Regardless of this, economic liberalism holds that human agents are the central focus of value and that therefore valuation is a wholly anthropocentric procedure. It also supports the notion that all people are, at least to some extent, rational and self-interested. Altruism is possible but it tends to be an outcome of socialisation and not necessarily all-pervading. Even the rules of justice, which tend to control and limit people’s activities are usually seen as ultimately in people’s own self-interest (Vincent 1998 p445). On this basis the underlying assumptions that guide people’s decision-making can generally be summarised as being: human-centred, self-interested and constrained by scarce resources. This forms the basis for the need to arrive at positions of compromise in any environmental debate. The arousal of opposing positions is almost inevitable when self-interest meets an issue of scarce resources.

One major outcome of the extension of liberalism into matters associated with the environment is that a variety of philosophical positions have evolved ranging from extreme anthropocentrism to fanatical ecocentrism (see, for example, Eckersley 1992). The ecocentric view contends that the ecosphere is the centre of value. It represents a set of values not given by humans and is concentrated in 'intrinsic' worth which may be rational but is not economic. This view disregards any need for economic valuation and tends to rely almost entirely on environmental activism for its expression. At the other extreme, hard-edged anthropocentrists assert that the environment in general can be destroyed, manipulated or polluted, as long as it serves human needs: environmental value is market value - the price of acquisition based on pure market principles.

*All ethical reasoning, according to O'Neill (1997 p127), is anthropocentric, 'but anthropocentric starting points vary in the preference they accord to the human species'. 'Most of us agree' O'Neill continues 'that we should value the environment or at least bits of the environment; few of us agree why we should do so'. At least part of the dilemma can be traced back to the roots of Western Traditions (Beatley 1994, Singer 1994, Sarre 1995).*

Western attitudes toward nature grew out of a blend of those of the Hebrew people, as represented in the early books of the Bible, and the philosophy of the ancient Greeks.

'And God said, Let us make man in our image, after our likeness; and let him have dominion over the fish of the sea, and over the fowl of the air, and over the earth, and over every creeping thing upon the earth' (Genesis 1:26).

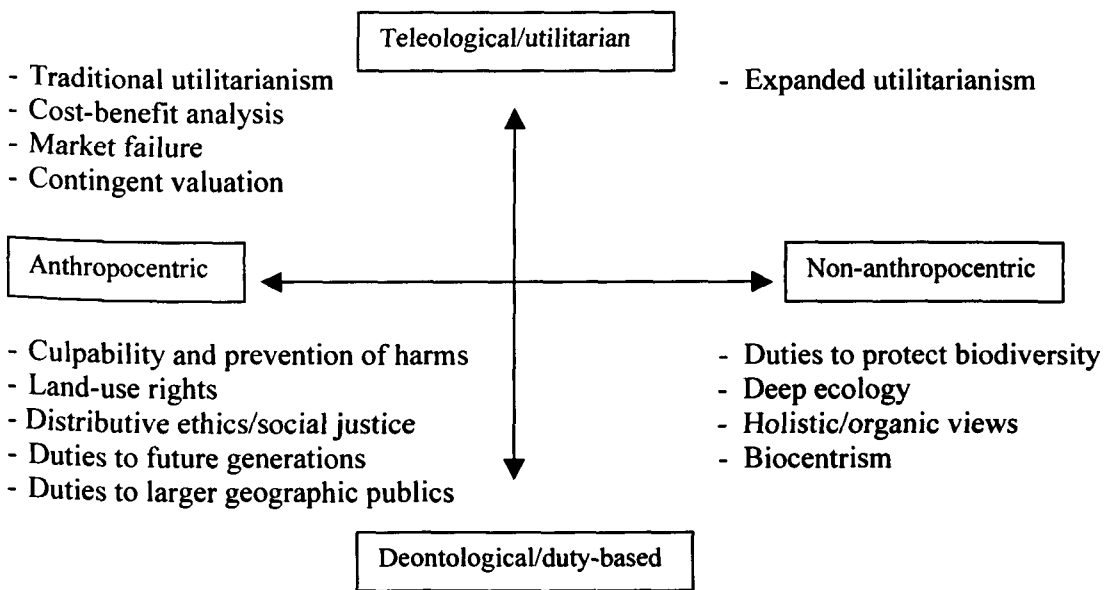
Today the debate continues as to the meaning of the grant of 'dominion'. Those concerned about the environment claim that it should not be regarded as a license to exploit but rather as a directive for stewardship: to look after the elements of nature. However, there is little justification in the text itself for such an interpretation; and given the example God set when He drowned almost every animal on earth in order to punish humans for their wickedness, 'it is no wonder that people should think the flooding of a single river valley is nothing worth worrying about' (Singer 1994 p 266). Harsh as this tradition is, it does not rule out concern for the preservation of nature, as long as that concern can be related to human well-being. Such philosophical themes have driven the formation of social attitudes, which themselves have evolved into various streams including the didactic opposites of capitalism and Marxism.

Sarre (1995 p116) claims that economist Max Weber showed that as Protestantism was ideally fitted to the rise of capitalism, so the tradition of exploitation helped to launch the development

of industrial society. Whether guided by the profit motive or by state socialism, industrialisation has brought unprecedented material affluence to a minority of the world's population at the cost of gross inequality between people and of substantial environmental destruction. Reactions to the rise of industrialisation have been explored by Brown (1990), who recognised three important strands. First was the idea of *stewardship*. This represents a variation of the 'dominion' theme and emphasises that humans are not freehold owners of the earth but tenants, and as such they are responsible for keeping the property in order. In the traditional concept, accountability was to God as creator, but this was taken less seriously as society became more secular. The second theme was that of *utilitarianism*, explicitly designed as a rational and secular doctrine that would guide policy without recourse to religion or metaphysics. Its early followers, including Bentham, advocated measures based on the maximisation of pleasure and minimisation of pain in allocating resources between social groups. In practice, the difficulty of measuring pleasure or pain led to an emphasis on demand, which made utilitarianism an ally of market economics. Brown's third strand was *romanticism*, with its stress on individual encounters with nature. This is the position that goes furthest toward the aesthetic.

The real confrontation, according to Eagleton (1990), was with socialism which was a movement with little concern for the environment. Marx was so preoccupied with production for human need that he could not discern any value in unexploited nature. He was extremely critical of romanticism because he regarded its view of nature as sentimental and insufficiently aware of the human struggle for survival. Out of the rise of social and political movements such as Marxism came a growing awareness of a polarity in ethical views toward human needs and the world in general.

Frankena (1973) suggested a schema (Figure 2) for the division of ethical worldviews based on the opposing dogmas of teleological theory (derived from the Greek word *telos*, meaning *end* or *goal*) and the principles of *deontology* (Greek, *deont*, that which is duty or binding). A teleological perspective advocates policies or actions which generate the greatest quantity of value. Conversely, deontologists assert that 'certain features of the act itself other than the *value* it brings into existence' are also of importance to the decision-making process (Frankena 1973 p15). This may also be described as socially and ethically 'duty-based'. Beatley (1994 p24) contends that much of contemporary land-use policy is explicitly founded on a very anthropocentric application of teleological principles. He also stresses the point that disagreements over public policies have often been the result of clashes between the held teleological and deontological views of the protagonists.



**Figure 2.** *Ethical theories and land-use positions.* Adapted from Beatley (1994)

Some environmental philosophers (for example, Rolston 1994) argue that anthropocentric ethics enable subjective values to be determined for aspects of the environment. Without such a position, objectivist meta-ethics are required and there is no clear evidence from the literature that derivation of this type of ethical position is as yet possible. If it became apparent that an objectivist view was possible to elicit, then values would simply be ‘discovered not conferred’ (Elliot 1996 p221). Even though a Western tradition of resource management has come to dominate much of the ‘developed’ world this does not preclude alternative ethical positions and attendant value-orientations from evolving. The major problem with the dominance of the anthropocentric-oriented view of resource management is usually not that of conflicting value assessments held by the protagonists. It is instead, with the often-unclear rights and obligations that are attached to the asset. The problem that this creates relates to conflicting subjective ethical starting points which may, in many cases, lead to consolidation of adversarial positions rather than drawing protagonists closer together. This is usually when social, political and economic compromise negotiations become necessary.

An important primer to the growth in public environmental awareness has been the consciousness-raising capacity of environmental information and education. The publication of Carson’s (1962) *Silent Spring* is often quoted as the turning point in broader environmental awareness. It questioned the foundations of Science and the somewhat mystical capacity it had to be publicly unquestionable. Carson opened the case for a wider public debate on the dominance of scientism and its negative environmental impacts to a generation of people who

had largely accepted that the 'externalities' of science were an unintended but nevertheless unavoidable, public cost. It coincided with the growth in democratic social unrest in many European countries associated, in particular, with protests about the Vietnam War and civil rights. It was also concurrent with the discernable shift in broader public sentiment from a *modern* to a *post-modern* world-view in most Westernised countries. Liberalism spread throughout the 1960's to include concern for aspects of the environment and resulted eventually in the creation and subsequent election of so-called 'Green' politicians to many parliaments. The expansion of public environmental concern has been extraordinary when considered against the relatively short time-frame involved. The growth in mass communications has offered the worldwide environmental movement a very powerful vehicle to promote, educate and empower.

The growth in public environmental sensitivity since the early 1960's suggests that while most people have not become unmitigated ecocentrists, a shift to a more sympathetic affinity for the environment has occurred (Frawley 1994, Webler and Renn 1995). Moderate anthropocentric arguments stress, to varying degrees, that human beings remain the sole arbiters of value. Importantly, that value may express itself in either *economic* terms for those who lean toward the conservative end of the moderate scale, or in *axiological* terms for the liberal-minded moderates. The shift in sentiment toward the middle ground, away from hard-edged anthropocentrism and in the broad direction of ecocentrism, presents exponents of stated preference economic surveys with a major challenge. That is, there is an increasing tendency for 'infinity' (or similar) answers to be provided in response to "how much would you pay for...?" environmental questions. The problem for them is that there are simply more people willing to express environmental sympathies that are not easily captured by consumer preference elicitation strategies such as CV. Ultimately, the problem has most probably arisen from the growth in social awareness of environmental issues that has changed people's perceptions from those of self-centred gratification-seeking *consumers* to conscientious *citizens*.

Sagoff (1988) argues that people in general have the capacity to discard their 'self-regarding values' and adopt 'community-regarding values' when it comes to environmental justice. His central claim is that humans have shared values in health, safety, cleanliness, clean air and water, and wilderness. This suggests that these community-regarding values constitute 'the common interest'. Convictions about these are beyond private interests. Thus the dignity of these values is not reflected in a market price. He goes on to draw a distinction between the wholly self-interested consumer who, in essence is a hard-edged anthropocentrist, and the community-regarding citizen, who may be anything else on the continuum up to, and including, an extreme ecocentrist.

Sagoff argues that consumer values fit comfortably with cost-benefit analysis because they adopt market value as their orthodoxy. Conversely, any other position on the anthropocentric-to-ecocentric scale may be reflected in a citizen value and not so easily transposed into WTP and CBA. Blamey, Common and Quiggin (1995) contend that responses to CV questions about environmental preservation are dominated by *citizen judgements* concerning desirable social goals rather than by *consumer preferences*. An important point they note is that the more complete and realistic the problem-setting presented, and the more information included in its description, the more likely it is that citizen-based responses will be elicited.

Citizen-based decision-making implies that people will act in accordance with deontological (duty or rights-based) beliefs rather than narrowly self-interested utilitarian teleological ones. Spash (1997) argues that the idea that people often act on deontological principles contrasts with the value structures known to underlie neo-classical economic theory.

‘While making decisions on a utilitarian basis may seem eminently sensible to most economists, the approach is rejected by those holding a principles-based or deontological approach to life. In this context decisions are made on the basis of whether the act itself is right or wrong regardless of the consequences. This contrasts with teleology which is the branch of knowledge dealing with ends or purposes and from which utilitarianism grows’ (Spash 1997 p405).

One central aspect of deontology leads economists to reject the notion. That is, the denial of the rationality attributed to making trade-offs, as long as enough compensation is offered in return. This can be summarised, according to Spash, as ‘everybody has their price’. Even WTA estimates represent people’s acknowledgement of a reservation price at which they are likely to be indifferent to the loss of amenity as long as adequate compensation is paid. This suggests that even deontologically-motivated individuals will set hurdle prices beyond which they may be willing to forgo the good in return for an off-setting benefit. On this basis, economists have a strong argument to suggest that even deontologists can act as economically rational individuals who simply hold a higher reservation price. Despite this, using such broad generic descriptors and dividing people into either deontologists or teleologists with an anthropocentric or ecocentric leaning probably does little to cast light on the question as to whether an individual will *ever* only act on one set of principles, or whether adaptation to the contingent milieu is possible. Regardless of this, such an argument suggests that the issue of pre-existing rights, and duties to broader geographical and temporal communities may have a strong bearing on the way that many people will respond to questions of environmental valuation. On this basis, the fact that CV is still promoted as the only method by which an estimate of value -

taking into account distant and future consequences – is possible, should provide some concern for anyone generally favouring a deontological view of the environment.

### 2.2.1 Choice under uncertainty

No matter how much time and energy an individual (or decision-maker) spends gathering information about a decision, most choices are made without the benefit of perfect knowledge. Decisions made under uncertainty are essentially gambles. It is precisely because so many decisions – both private and public – are made under conditions of uncertainty that the principles of caution and harm minimisation are gaining broader acceptance. The most public example of this is by the World Commission on Environment and Development (the so-called Brundtland Report 1987), which espoused sustainable development tempered with the application of the precautionary principle. The principle suggests that if there are threats of serious or irreversible damage, then lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. It is the same principle that is captured in many public authority agreements such as the *National Strategy for Ecologically Sustainable Development* (Council of Australian Governments 1992).

There are three main ways by which uncertainty and risk can be reduced (Pindyck and Rubinfeld 1994): diversification, insurance, and extended information about choices and payoffs. It is worthwhile dwelling on these three alternatives as each has a potential role in the application of the values jury. In the public sphere, diversification implies a broadening in the range of goods that are likely to hold an amenity value. So, for example, promotion of civic awareness about the range of historically important houses by local authorities may prove beneficial when the loss of one of those houses becomes inevitable (due to natural deterioration or planned destruction). The reduction in public amenity associated with the loss of the house may be diluted by the presence of one or more similar houses not subject to the same threat. Without diversity, environmental features become unique and are prone to hold high marginal values to the public. Concern about risk and uncertainty is reduced in proportion to the level of stock, and therefore to the scarcity of the good. Obviously, features with some sort of historic or other social significance cannot be hastily ‘created’, but with an increase in public awareness the focus of attention may possibly be diluted if the existence of similar features in the environs is brought to public attention.

Risk-averse people are willing to forgo income to avoid risk. Purchasing insurance assures a person that they will generally be compensated for the loss they suffer. Under conditions of costless administration and no profit-seeking activity, the total cost of insurance to a defined



group is equal to its expected loss, and this represents a fair gamble (Frank 1997 p203). It is the law of large numbers which suggests that for a large enough group of people, the proportion who will have accidents is extremely stable and predictable. It is therefore the pooling arrangements of insurance costs that holds some capacity to estimate the value of a loss: the maximum compensation is the lesser of the total pooled payments held specifically for that type of loss, or the estimated value of the loss to the owner. It is possible to extend this principle to estimate the total insurance value of an asset. It should be made clear that under these circumstances the insurance value may differ considerably from the actual public amenity value if the asset is a public good. If all who may be impacted by a loss are able to identify their willingness to pay for insurance that will satisfactorily compensate them in the event of the loss occurring, then the cumulative premiums paid could act as a fair indication of the value of the asset. But this will only occur if the actual loss is equal to or less than the magnitude of the insurance pool. This represents a re-statement of the theory behind estimates of the total economic values identified by WTP strategies. On this basis, an individual's WTP may represent a magnitude of willingness to commit to an insurance policy to protect an environmental asset rather than represent an overt estimate of value to themselves. This would then make sense of Ward and Duffield's (1992) finding that members of the impacted community were willing to pay only \$3.50 to avoid the loss of a scenic waterfall. Equating the value of the permanent loss of such a feature to each of the impacted members of the community with the price of a can of beer or packet of breakfast cereal makes little intuitive sense. Suggesting that the \$3.50 in fact represents each member's willingness to contribute to an insurance policy to ensure the retention of the waterfall, appears more credible. The total insured value estimate would remain limited to the collective amounts identified as willingly paid by each community member because the magnitude of the payout is limited to the size of the pooled premiums. But, at least under these circumstances, the pooled premiums would still be seen as only representing the minimum insurance value rather than the consolidated (axiological) public amenity value.

The decisions a person makes when outcomes are uncertain are by implication, based on limited information. If more information were available, she could make better-informed decisions and reduce overall risk. This raises the question as to what extent information and education have a bearing on changing people's perception of environmental value (at both the economic and axiological level). Specifically, to what degree can people's preference ordering be altered by the introduction of information? When dealing with preference ordering, economists rely on the assumption that transitivity exists. Transitivity is the condition which holds that when A is preferred to B, and B is preferred to C, then A is also preferred to C. But, on occasions it is known to be absent. This can sometimes arise as a result of alternatives being described in

logically equivalent but emotionally different terms. This state of intransitivity is a problem in liberal democracies because it suggests incommensurate preferences. Barber (1984) proposed that if values and interests often appear incommensurate it is primarily because they are not well exposed to - or understood by - the observer. In other words, the critical role of information may have been overlooked. Understanding the information that the observed is party to is the means to clarify the apparent paradox from the observer's point of view. Conversely, it is logical that the preference ordering of the participant may be altered by the intrusion of information not previously known to him/her whilst still being observed. If this is the case then the question arises as to what extent an injection of information may cause participants in an environmental valuation elicitation exercise to alter their preferences during the exercise.

Critics of stated preference techniques such as CV claim that one of its many weaknesses is that respondents are presented with limited information to assist in the assessment process (Haneman 1996). Under these circumstances, question framing is also critical and if the question is not well understood by the participant then a deviant answer is likely. In addition, if the issue in question is not one familiar to the respondent, he/she has little opportunity to seek information or clarification. Despite the harsh criticisms, economists have discovered few novel alternative means to elicit – in economic terms – private preferences toward public goods. And so CV, despite its limitations, remains the preferred method. In the absence of a demonstrably more reliable alternative, CV is also the technique of value elicitation incorporated into the values jury trials in this research.

### **2.3 The role of collective choice**

CV and other forms of stated-preference elicitation techniques have the primary goal of revealing the magnitudes of people's attachment to a public good in the form of a unifying measure. Whether the methods actually achieve this is subject to speculation. Despite this, the ultimate purpose of employing these techniques is to provide those who make decisions about such goods with an empirical measure of stakeholders' values associated with the asset. The explicit role of the decision-maker is then to determine a level of usage of the good that approaches a Pareto-optimal allocation. This is the one that, while not necessarily completely satisfying every stakeholder's preferences, seeks to arrive at the most appropriate compromise. Technically, it is the allocation for which there is no other feasible reallocation that is preferred by one party and liked at least equally well by the other parties. Essentially, such allocations are ones from which further mutually beneficial moves are impossible. While such allocations are almost inevitably impossible to achieve in practice, they can act as a target for most genuine

attempts at satisfying a variety of social concerns. The Coase Theorem finds a niche for itself under these circumstances.

Coase's suggestion that economically efficient outcomes can result from non-strategic negotiations between conflicting parties is also important for another reason. In the absence of empirical evidence it can only be *assumed* that a negotiation has resulted in the maximum possible welfare accruing to all parties. In many ways it is therefore a hindsight model. The actual value of the costs and benefits attached to the decision process under Coase circumstances are seldom revealed and parties may still feel that although they have been willing to compromise, their ultimate net benefit may have been greater had they been more effective negotiators.

The natural desire of each party to receive the greatest possible benefit from such negotiations suggests that non-strategic – good faith – compromises may be relatively rare achievements in practice. Oates (1996) offers an alternative that avoids Coase's problem relating to the lack of explicit economic revelation. He suggests that, particularly where public goods are concerned, all parties need to reveal their true position in a common vernacular, usually unified by an economic metric. The most efficient outcome can therefore be achieved when negotiations are conducted within a framework that encourages discourse, using positions revealed in both economic and non-economic terms, and explicitly framed to reflect the preferred will of the stakeholders. On this basis Oates recommends a hybrid model for determining the demand for – and value of – public goods that incorporates the characteristics of both contingent valuation and collective choice processes. The one major constraint on such a model admitted by Oates is that it must be possible to identify the jurisdictions in which citizens participating in the process have control over the good in question. People who provide input into data collection and decision-making about issues that may not ultimately affect them or their community are poor sources of information. On this basis, 'local' people are the most appropriate providers of local preferences and intensities.

Although CV receives considerable attention in the economic literature as a practical aid to decision-making, there is also a wide range of collective choice techniques available to provide authorities with parallel public input, particularly for local issues. These include Search conferences, Delphi techniques, vision conferences, strategic planning workshops, policy juries, citizens' juries, open forums and focus groups. None is without its critics (see, for example, Seiler 1995, Armour 1995). Open forums, for example, may provide decision-makers with a venue to capture public sentiment, but they are more often patronised by those with an uncompromising agenda representing a vested interest (Coote and Leneghan 1997). More

generally, such techniques may arrive at conclusions that provide decision-makers with a broad range of *qualitative* input, but little substantial 'hard' data with which to argue for a compromise. This is a particularly vexing situation for public authorities who may find it difficult to counteract a strong economic (quantitative) argument with nothing more than vague impressions of public sentiment delivered to them in a non-standard form. On this basis decision-makers have shown a continuing preference to have their public-choice data requirements satisfied by reference to either a majority voting system or a cost-benefit analysis (Frank 1997 p628).

Majority voting is a powerful means of identifying group preferences. It represents one of a range of methods intended to capture public preferences, and is applicable to a vast range of sample (or population) sizes. For example, it is used in most Australian Local Government decision-making, where, as representatives of the community, councillors typically number only twelve or fewer. At the other extreme, majority voting is invoked to determine the preferences of electors on a national scale in Federal elections. Opinion polls, surveys and referenda represent other means by which a majority preference may be revealed. The problem that they encounter is that they may tend to be superficial and non-interactive, and designed to elicit the uninformed views of the general public. Opinion polls share this criticism with surveys (Coote and Leneghan 1997). This major weakness is also one that is applicable to survey-based valuation techniques such as CV. Referenda also have a major limitation. In their favour they may provide ample opportunity for dissemination of information on a large scale. The problem is that the issue at stake generally has to be distilled into a simple 'yes/no' vote and the model can be considered as relatively blunt, rather than as an instrument of precision. Referenda are also not conducive to execution on a small scale about local issues.

Despite such criticisms of the methods to elicit majority opinion, the underlying faith in majority voting *per se* - as a means of identifying the broad will of the stakeholder group - remains largely preferred to other, less democratic, alternatives. Revelation of majority-preferred options as a means of input provision into public environmental decision-making is a form of Environmental Assessment (EA) that is becoming increasingly common. For example, under s.7(c) of the *Local Government Act NSW 1993*, one of the central purposes of the Act is stated as 'to encourage and assist the effective participation of local communities in the affairs of local government'. Section 8 goes on to remind each municipal council that under its general charter it must 'bear in mind that it is the trustee and custodian of public assets' and facilitate the involvement of the community in local government. Councils can, at their discretion, take a poll of electors on any matter, including, for example, a major development application having potentially serious environmental implications (Farrier 1993 p435).

On this basis, economic valuations of environmental goods may form one possible component of preference-based systems commonly deployed as part of EAs. As such, these valuations represent one element of the information base available for voters upon which their personal preferences may be formed. Although EA has its foundations in practical problems of decision-making, its philosophical base is the wider preference-based ideas in which the source of value is firmly rooted in the subjective individual belief of the valuer (Prior 1998 p437). In this sense, EA has evolved in the same philosophical tradition as cost-benefit analysis (CBA). However, as Prior emphasises, EA ‘essentially starts from the *one man, one vote* base which is counter-posed to the market based principles of CBA’.

Voting is commonly used to decide questions of allocation. An important feature of majority voting under conditions involving resource allocation is identified by the *median voter theorem* (Black 1958). This states that the preferred outcome of the median voter will always win an election against any other alternative. The question that arises out of this is whether – from an economic point of view – this will result in an efficient outcome and subsequent equitable allocation of resources. Unfortunately, without supplementary information, the answer is generally ‘no’. The reason for this is that majority rule is inefficient because it weighs each person’s preference equally. The *efficient* outcome should weigh each person’s vote by the *strength* of their preference (Pindyck and Rubinfeld 1994 p656). In other words, majority voting completely obscures important differences in the intensity with which voters hold their preferences. CBA represents a very powerful tool for providing the supplementary information required to make majority rule voting effective.

CBA is a central element of the practice of welfare-based economics. It may stand as an adjunct to majority voting or, as is often the case, be used as an alternative to it. As an alternative, it attempts to make explicit how strongly people feel about the options under consideration. Its traditional application is in measuring the intensity of preferences to determine how much people would be willing to pay (or accept as just compensation) for the various options. Importantly, the CBA test is intended to result in a Pareto-optimal outcome. If CBA satisfies the Pareto criterion while majority voting on its own does not, a question arises as to why majority voting is so often invoked for making collective choices. The primary objection is that because CBA so heavily (and traditionally) relies on WTP measures, it gives insufficient weight to the interests of people with limited financial resources (Frank 1997 p633). On this basis the poor may feel very strongly about an issue, and yet their feelings will not count as much in CBA because they have limited willingness-to-pay capacity. Frank goes on to suggest that critics of CBA sometimes concede that it would lead to Pareto-optimal outcomes *in*

*every case* if it were practical to make the necessary compensation payments. But compensation payments are not practical on a case-by-case basis and so CBA results are sometimes ignored because they have not adequately captured the true strength of feeling. This suggests that a more precise measure of people's preferences that could be incorporated into a CBA analysis without adjustment is the revealed measure of people's willingness-to-accept (WTA).

Although mainstream economics is still not wholly in favour of promoting the concept of WTA as the more appropriate measure of value, Sagoff (1994) makes the point that the search for a valid measure should continue but only on the basis that the underlying problem is not overlooked. That is, progress in resolving environmental conflicts for example, will always remain dependent on building social and political institutions for protecting the environment. It is in this context that he suggests that the measurement of the strength of public and privately held values has a role in substantiating the magnitude of commitment that people have to a public asset. But these in isolation will not substitute for policies and rights-based public decision-making that provide a fair and equitable assessment of the issues at stake. Public decisions made purely on any measure of economic rationality are bound to overlook the moral and ethical considerations attendant to any sensitive public-asset issue.

In offering the concept of the *consumer* versus *citizen* dichotomy, Sagoff (1988) uses this partly as a means of overcoming the rationalistic approach that economics applies to public-issue decision-making. Prior (1998) suggests that instead of criticising CBA and related analysis in this way,

‘...it would be a good deal more interesting to discover whether a preference-based process of [public asset] assessment, using all the appropriate tools of consultation, background research, information dissemination and, ultimately, a democratic form of decision-making expressed as preference-based ‘votes’, could be found’ (Prior 1998 p437).

Criticism of both democratic (vote-based) and economic (WTP and CBA) attempts to reveal the true strength of people's public preferences remains common. It is the need for the discovery of something better to offer to replace or at least supplement them that remains a major challenge to the process of fair and equitable public decision-making.

### 2.3.1 Citizen participation and discourse

At the very broadest level, it is important to have the perceived obstacles to sound public decision-making identified so that they can be factored into the resolution process. These may include the varying levels of power held by the parties, the nature of the opposing interests, and the distinct nature of the system within which the conflict is intended to be resolved, including, for example, the prevailing political system, the (local, regional or even national) economic system, and the legal system (Papadakis 1996). Possibly more important though, is the need for methods to operate effectively within these social constraints for the purpose of identifying values as an aid to the resolution process.

The growing demand for a more inclusive and consultative approach to public decision-making is a direct outcome of the rise of democratic liberalism in the past thirty years (Webler and Renn 1995). Attendant to this has been a perception that effective and legitimate decision-making requires the involvement of those who will be affected by the outcomes (Renn, Webler and Wiedemann 1995a). This has led to demands for more public involvement in such processes. It is therefore now considered generally inadequate to have ‘experts’ argue over the details of public values without at least some input from those impacted, regardless of their potentially very personal, and anthropocentrically-biased, perceptions.

The fundamental debate about the role of public participation centres on the opposing views of elitists and egalitarian interpretations of democracy (Wiesendahl 1987, cited in Webler and Renn 1995). The competing theories behind these two interpretations are usually labeled liberal democratic theory and participatory (or direct) democratic theory. The elitist (or liberal) view claims that political elites compete for votes in much the same way that sellers compete for customers. The public has a right to determine which of the competing elites are allowed to govern, but the substance of political decisions is made principally within the elite circles. In contrast, the egalitarian view of democracy is inspired by the normative claim that each citizen should be able to co-determine political decisions that affect his or her livelihood. Between the two extremes are numerous combinations ranging from a pluralistic view in which political elites need the participation of key interest groups to legitimise their decisions (Dahl 1989), to the neo-corporatist view in which the key social participants such as industry and the unions, negotiate solutions behind closed doors (O’Riordan and Wynne 1987). Regardless of which political system is operative under any specific prevailing circumstances, it is clear that the identification of values - as reflected in the conceptual approach adopted by the protagonists in any public-issue debate – is fundamental to the resolution process.

Two main types of theories have emerged in sociology to explain how values are selected and prioritised. *Consensus* theories claim that society is maintained through shared opinions about norms and values (Etzioni 1993). *Conflict* theories explain that the ruling groups impose their values upon others and that there is no place for collective agreement on values (Blalock 1989). Consensus theories have been criticised for justifying dictatorships, totalitarian regimes, and for encouraging mechanistic approaches to governing (Bachrach 1967). Similarly, conflict theories are criticised for devaluing the importance of individual autonomy and cultural diversity (Bernard 1983). That neither of these dichotomous systems is perfect is self-evident. That one should be encouraged over the other to justify the need to satisfy any public authority's obligations to its constituents is also contentious. But one important outcome of the growth in awareness of the public's right to influence the decisions of authorities is that people impacted by such decisions are recognising that they should be allowed to participate in the process.

In many ways it is unfortunate that evaluations of public participation in decision-making processes have been so tightly linked to serving the interests of particular individuals or groups. The unwanted 'baggage' of both consensus and conflict theories tends to impede opportunities to improve participation techniques. What has resulted is a large degree of distrust in public policy formation programs, with administrators on one side offering public participation opportunities but with no real power to citizens, and locally-impacted citizens routinely adopting relatively raw activist responses as a means of contending with their sense of limited power. Renn, Webler and Wiedemann (1995a p7) argue that it should be possible to move away from these subject-centred views of participation, which focus on the conflict/consensus dichotomy, and on to a view of participation involving the revelation of shared values and interests. Sagoff (1988) proffers a similar 'shared values' resolution to the consumer *versus* citizen debate. The non-subject-centred perspective is based on a belief that both consensual theories and conflict theories have important contributions to make, but he contends that neither should be allowed to dominate in a public participation process. Revealing entrenched positions, avoiding adversarial posturing, and participating in a spirit of co-operation by demonstrating a willingness to find an appropriate level of compromise, are the ideals upon which the non-subject-centred approach is based. Although it would be naïve to believe that a single process is faultlessly suited to encouraging the exercise of such ideals, there is one underlying element that appears to be gaining increasing acceptance as a positive aid in the pursuit: discourse.

Habermas (1981) focussed on what promotes and hinders inter-personal communication, and drew the distinction between instrumental and communicative rationality. Instrumental rationality involves attempts by local parties to measure the costs to themselves of taking a particular course of action. Conversely, communicative rationality emphasises the possibilities



for mutual understanding between the parties. Without identification of such rationalities, differing disciplinary assumptions and conceptual frameworks may act to actually discourage resolution of contentious public issues including for example, environmental disputes. On the basis of this example, ecologists may focus on ecosystem functions and services, while ethicists focus on the system's intrinsic worth, and at the same time environmental economists attempt to assess the system's values as expressed by consumer preference theory: all with the welfare of the environment in mind, but all operating within differing conceptual paradigms. Ultimately, the objective of such an exercise is to ensure that an appropriate level of environmental protection is achieved with the maximum support of the impacted public. In considering the circumstances in which ecological valuation and decision-making occurs, Dryzec (1987 p33) suggests that they are characterised by 'complexity, non-reducibility, variability, uncertainty, collectiveness, and spontaneity'. Elsewhere (Dryzec 1990 p17), he argues that simple compromise between different views is defensible to the extent that it is reached under communicatively rational conditions. O'Hara (1996) uses this as a basis for her belief in the need for a discursive ethic to be adopted to encourage public conflict resolution. Her argument is that,

'discursive ethics is a communication process in which discourse participants share their concerns, expecting mutual acceptance and respect for their positions. It is not a process of isolated individuals engaging in thought processes, universally accepted or otherwise. Discursive ethics can neither take place in isolation nor can it be purely theoretical. It needs to be practiced, and its practical dimension is undeniably political' (O'Hara 1996 p97).

She goes on to suggest that such an ethic represents a critique of commonly accepted public-issue valuation fundamentals.

'Active dialogue can bring about change or at least uncover barriers to change. This uncovering of barriers and hidden valuation concepts may well be one of the most valuable contributions of discursive ethics. However, an ethical discursive valuation process must go beyond any 'expert' community to include the diverse voices of those affected by common valuation practices, particularly those who have been unheard' (O'Hara 1996 p105).

In practice, communication to promote the identification of the values held by stakeholders involves much more than just Habermas's 'rational discourse' or the encouragement of a spirit involving O'Hara's 'discursive ethics'. Ultimately, participants may adopt an uncompromising

strategic position with no intent to reach an agreement. Ironically, under these circumstances it would be unethical to attempt to persuade any particular participant to change his or her stance. For the advocates of increased public participation the principal challenge then, is to uncover methods of participation that may provide the circumstances in which the ideals promoted by Habermas and O'Hara can best be pursued. Such methods should be guided by the fundamental principle that they must be *fair* and *competent* (Renn, Webler and Wiedemann 1995a p10).

There are several innovative models of public participation that claim to achieve a strong element of fairness and competence in practice. These include citizen advisory committees (Hutcheson 1984, Lynn and Kartez 1995, Vari 1995), citizen panels (also known as planning cells) (Crosby, Kelly and Schaefer 1986, Deniel and Renn 1995, Seiler 1995), and citizens' juries (Crosby 1995, Armour 1995).

Citizen advisory committees (CACs) is the generic term for a reasonably wide range of citizen-based groups that are generally convened by a sponsoring organisation for the purpose of providing representative ideas and attitudes to a proposal made by the organisation. CACs are usually characterised by a highly restricted attendance. Members are primarily selected by the institution seeking advice or public opinion. Selection is often based on a sample that includes representation of the major interested parties. Due to the limited size of the committee it is unlikely that all interested parties are able – or even invited – to attend. Interested citizens may be able to observe meetings, but they are not usually able to participate in the structure, agenda-setting, or formatting of the discussions. Often this is tightly controlled by the sponsoring organisation.

Citizen panels involve the participation of groups of randomly selected individuals who are commissioned to learn about the technical and political facets of various decision options pertaining to a particular public interest issue. They are offered opportunities to evaluate the options and the consequences according to their own set of values and preferences. Typically, a panel meets for several consecutive days to consider the issue. At the end of this time a 'citizen report' is prepared by the participants. According to Renn, Webler and Wiedemann (1995b), the fairness of citizen panels hinges on the success of the random selection process.

Citizens' juries are similar to citizen panels in that they tend to rely on a randomly selected pool of citizens to evaluate policy alternatives. The major difference between the two is that juries are typically much more focussed on a limited range of policy options. In Australia, the first widely publicised application of the citizens' jury process was associated with a debate about the development of genetically engineered foods, held in Canberra in early March 1999. The

14-member ‘jury’ of lay people sat for three days and listened to expert opinions about various aspects of the topic. The jury members were volunteers who had responded to a nation-wide advertising campaign. As the press reported at the time,

‘It was during question time that the strengths of this conferencing approach were displayed. The surprisingly articulate members of the lay panel cut to the core issues that bothered them as ordinary citizens, and labeling was a big one’ (Smith 1999 p40).

According to Renn, Webler and Wiedemann (1995b p345), ‘experience has shown that citizens who participate [in the jury process] take it very seriously...and fulfil, very well, the task of ‘value consultants’.

### 2.3.2 Assessing citizen participation and discourse

Although the concept of increased public participation is generally considered to be a noble one, the problem of actually assessing the efficacy of any particular approach on an objective basis remains unresolved. To be able to make a judgement about how well a certain technique works, a procedural normative model is necessary. A normative model of public participation is one that expresses and defends a vision about what should be accomplished and in what manner. There is little provided in the literature that offers a guide to what constitutes effective participation. Webler (1995) suggests that the two main arguments upon which the need for public participation is built are ethical-normative and functional-analytical. Taken together they point to the requirement that public participation should pursue the twin goals of *fairness* and *competence* in an environment where discourse is encouraged. Fairness, according to Webler, infers that everyone who takes part does so on an equal footing. That is, they should have equal rights to speak and raise questions, and equal access to knowledge and interpretations. Competence relates to each participant being provided with the right to protect their own interests while simultaneously contributing to the collective will in the process. In this sense it refers to listening and communication skills, self reflection, and consensus building.

In the absence of any well-recognised objective metric for measuring the efficacy of a participation process, Webler offers his own (refer to appendix A for a complete listing of criteria). He firstly relies on the rules of Habermas’s (1973, cited in Webler 1995) *ideal speech situation* to refine his own guide to a set of normative discourse rules.

- 1 Anyone who considers him- or herself to be potentially affected by the results of the discourse must have an equal opportunity to attend the discourse and participate.
- 2 Every discourse participant must have an equal opportunity to make validity claims to comprehensibility, truth, normative rightness, and sincerity.
- 3 Every discourse participant must have an equal opportunity to challenge the comprehensibility, truth, rightness, or sincerity validity claims made by others.
- 4 Every discourse participant must have an equal opportunity to influence the choice of how the final determination of validity will be made and to determine discourse closures.

(Webler 1995 p51)

To clarify the question of who should be invited to attend a public participation exercise, Webler recommends applying a rule of identifying and inviting the individuals - or their representatives - most likely to be directly affected by the ultimate decisions made. In many cases the affected population will be the same as the citizens of a particular community. At other times the impacts may extend well beyond that community. But he also reminds organisers that impacts can occur at all manner of levels including physical, psychological, social, and economic. In addition, selection of participants should be randomised as far as is possible.

'*Fairness*' is intended to reflect the normative ideal that people should be provided with adequate opportunity to meaningfully participate in all aspects of the discursive exercise. '*Competence*' relates to the idea that purposeful discourse is strongly encouraged in an environment where each participant has access to as wide a range of information as possible, and that the process should not be unreasonably discerning when certain information has to be filtered out (to satisfy, for example, time constraints). Webler's evaluative framework relies heavily on the work of Habermas (1984, 1987) for assessing the efficacy of a participatory method and identifies three fundamental components of discourse to which fairness criteria should apply: agenda and rule making, moderation and rule enforcement, and discussion. In addition, competence is required in each of four types of discourse: explicative discourse, theoretical discourse, practical discourse, and therapeutic discourse.

Explicative discourse aims to ensure that all participants have a reasonable level of understanding of the definitions of terms used and a comprehension of the jargon employed by various speakers. This may, for example, be a critical problem for non-native language

participants. Theoretical discourse addresses claims made about the objective world. For example, scientific data become part of a theoretical construction in the mind of a listener. For highly technical data, experts may have to be employed to reinterpret it for presentation without altering its essence. Practical discourse attempts to ensure that those likely to be affected by the outcome of a decision process are given due consideration in the participation exercise. This may involve inviting individuals to present their case to the forum participants, or employing experts to prepare specific scenario analyses. Finally, therapeutic discourse provides an opportunity for participants to undertake self-reflection on the topic. This could involve clarification of issues in a small group setting or provision of opportunities for informal discussions with other participants. Webler binds Habermas's various discursive action types together and suggests that,

'Habermas's practical insight is that societal decisions should be made through a discursive process in which collective preferences, interests, and needs are defined by the participants in accordance with their own free will. As long as people are not forced to surrender their values in the selection process, the final decision should reflect the best possible agreement' (Webler 1995 p73).

Webler presents a modest means of identifying the scalar dimension of the fairness of the discursive components coupled with a similar one for an assessment of the types of discourse included in the participatory forum. He suggests a '-', 0, '+' ordinal scale for ranking the extent to which each of the elements is treated in any such forum as a means of assessing efficacy. The evaluative assessment may be by a disinterested observer or, possibly more appropriately, the actual participants. Evaluation of discursive models is possible by employing any one of a wide range of techniques including action research (Kemmis and McTaggart 1988), empowerment evaluation (Fetterman, Kaftarian and Wandersman 1996), utilisation focussed evaluation (Patton 1997), and participatory evaluation (Arnstein 1969). In selecting a preferred method of evaluation and assessment, it is important, as Scriven (1991) points out, to differentiate between the need for *formative* and *summative* evaluation. Whereas the formative process is conducive to providing program researchers with useful judgements about improving a program, summative evaluation is generally conducted after the completion of a program or project for the benefit of some external audience or decision-maker. As such, an *ex-post* summative evaluation may prove more beneficial in convincing a policy analyst that the method employed to derive the input into a decision-making process holds a degree of credibility in terms of both fairness and competence.

Also important is the need to differentiate process- and outcome-based evaluations. The latter is generally conducted towards the end of a series of programs and is intended to review the efficacy in terms of the desired outcomes. For a novel project or program this may be difficult to apply and so a process evaluation is likely to be more meaningful (Dart, Petheram and Straw 1998). It is unclear as to whether Webler’s assessment criteria are specifically aimed at a particular combination of evaluative processes, but his schema appears to be a productive effort that attempts to assess various discursive methods particularly oriented toward the more novel types. In applying Webler’s assessment format, Renn, Webler and Wiedemann (1995b) ranked the three novel models of public participation previously noted (Table 1).

Obviously, each of the participatory models has its advantages and similarly, each is appropriate to a different setting. Despite this, Webler’s scale does offer one of the few modes of objective assessment of the basic characteristics of each model or, for that matter, for any other model of participation. Although his assessment rule is somewhat restricted to a relatively qualitative scaling, there appears to be no reason why it could not be adapted to some form of interval scale for enhanced statistical capacity.

Model	Competence				Fairness		
	Explic.	Theor.	Pract.	Ther.	Agend.	Mod.	Disc.
Citizens’ Advisory Committee	+	0/-	0/-	0	0	+	0/+
Citizens’ Panels	0	0/+	0	-	-	/-	0
Citizens’ Juries	+	0/-	0	-	-	0/-	0

**Table 1.** *Comparative evaluations of three models of public participation.*

(Explic.: explicative, Theor.: theoretical, Pract.: practical, Ther.: therapeutic, Agend.: agenda, Mod.: moderation, Disc.: discussion). (source: Renn, Webler and Wiedemann 1995b p340)

In addition to assessment of fairness and competence criteria, Renn, Webler and Wiedemann also provide a basic metric for the evaluation of the degree of discourse offered by each of the subject models. Their scale is a simple Likert 0-8 with the descriptors of ‘highly restricted’ through to ‘open’. In this set of cases they note that citizens’ advisory committees tend to have a highly restricted discourse capacity, while citizens’ panels and citizens’ juries fall in the mid-range.

In terms of the present study, the importance of the work of Habermas, and Webler and his associates, is that they provide a framework for assessing rational communication. In addition, they have constructed a basic metric for comparative analysis of differing participatory

techniques. Despite the relative simplicity of its scalar parameters, it nonetheless represents an attempt at providing an objective measurement of the efficacy of communicative actions. It appears that this form of assessment may be applicable to a wide range of public participation forums. A summary of Weblar's discursive assessment criteria is contained in Appendix I. The further challenge now exists in applying this framework to the demand for construction of a fair and competent model of public participation that satisfactorily captures the full range of public values.

## **2.4 The values jury process**

Use of juries to decide guilt or innocence, responsibility, compensation, and penalty, is a well-established legal institution. Application of this institution to matters of public value is a natural and logical extension. The *values jury* (VJ) represents a novel model of public value assessment that has the potential to avoid many of the problems of existing value estimates.

The VJ concept is an evolutionary step in the liberal democratic shift toward greater public involvement in socially-impacting decision-making. The forerunners to the concept are the citizens' panel and the citizens' jury, both of which were intended to invite transparent public input into the decision processes of public authorities. The single most significant difference between the VJ concept and the other citizen-based models is its attempt to translate people's intensity of commitment to public goods into terms that make its output satisfactory for inclusion in cost-benefit analyses. The citizens' panel and citizens' jury models tend to avoid the critical economic issue of measuring the cardinal magnitude of people's preference intensity. While this may be beneficial in vetoing unpopular proposals, the lack of a commensurate measure is prone to leave many pro-development advocates wondering how to justify their proposal in any other potentially acceptable form.

There are two fundamental potential roles of a VJ: to assist in selecting a specific course of action, such as a land management alternative; and, to determine a value magnitude. The former is a shared characteristic with other citizen-based models. The latter is unique to the VJ process. The obvious standard for modelling the scale of intensity in relation to value is the contingent valuation method. Despite its limitations, CV is yet to be replaced as the most respected process for determining the measure of value in the absence of objective data. Importantly, the VJ model presents an opportunity to apply the CV method in a very functional way.

Most difficult public management decisions involve conflicts over people's inherent personal values, such as preservation *versus* lifestyle, or fairness to current citizens *versus* fairness to

future generations. Trade-offs among such values are often particularly challenging for public authorities who hold the critical outcome in their hands. Under these circumstances compromises are usually necessary and the VJ has the potential to offer a useful level of input into such a process. Importantly, the VJ model allows the values of the participants – as representatives of a defined community – to be recognised as part of the process. The jury members are encouraged to question and discuss, and thereby gradually learn about the specific issue before indicating their preferred outcome via a registration of values. The process represents a method of achieving Vatn and Bromley's (1994 p143) process objective of requiring 'collective discussion...necessary to form a collective understanding and to construct a coherent basis for choice'.

The nature of the values jury is defined by the number of jurors and the process used to select them, the decision rule they are to use to reach a judgement, the constituency they represent, the information presented to the jury, and the authority the jury's judgement is given.

#### 2.4.1 Jury size

Choosing the number of jurors requires a compromise between pluralism and practicality. The larger the number of jurors, the more likely it is that a diversity of opinions will be reflected in the ultimate verdict. With size also comes a greater potential for the jury to understand and be sensitive to all of the issues. The literature on those citizens' juries implemented in recent years suggests that juries of up to 25 members are quite manageable. Carson (1994, 1995), Coote and Leneghan (1997), Crosby (1995), and O'Hara (1996) all report on implementing juries in the range of 20-25 participants without resulting in unintended difficulties. The key point in jury size selection is that VJs are based on the analogy of a judicial model rather than on that of a public opinion poll. It has been a long-standing convention that juries of 12 members commonly decide matters in a civil or criminal case. It is in fact the same number that has persisted since Norman times in Britain. The assumption is that 12 people who are well informed are much more effective participants than a larger number who are not. By implication, a well-informed jury of more than this number should be at least as effective in forming a respectable collective opinion.

It is relevant to note that none of the citizens' juries identified in the literature mention any attempt at identifying the statistical significance of the actual jury size. Each of the reported jury exercises was clearly based on the assumption that a group of 25 people can only vaguely represent a legitimate sample. This is not the case in practice. Jury-size decisions are no different from sample-size decisions used in statistical analysis. There are two estimates of error



to be considered in determining an appropriate minimum sample size. Firstly, the tolerable error that can be reasonably accepted between the sample estimate (jury) and the population parameter (community). The initial step in the process is to determine the level of representation required. In qualitative analysis, terms such as simple majority, special majority and unanimity infer rates of >50%, 50-100%, and 100% respectively. If a simple majority is all that is required, then a figure of only 50% + 1 is deemed satisfactory for inclusion in the sample size estimate. In this case the sample size tolerable error becomes the residual figure, 50% - 1. To ensure that the capacity for dispute is minimised, a figure of say 66% may be appropriate (and the corresponding tolerable error is then 34%). This indicates that the sample size will be representative of at least 66% of the community from which it is drawn.

Secondly, the level of confidence is to be nominated. Are the jury sponsors to be 100% sure that a 66% majority is being represented in the jury-size selection, or is a lesser figure appropriate? A figure of less than 90% may start to jeopardise the integrity of the jury process. The question becomes what is the minimum jury size that will allow the sponsors to be say, 90% confident that the number of participants is at least 66% representative of the constituency for which they are deemed to act as agents?

Using these characteristics - and applying z-value analysis as described in most common statistical texts, (for example, Luck and Rubin 1987) - jury sizes of 23, 23 and 24 are derived for affected community sizes of 1000, 10 000, and 100 000 respectively. The relatively large tolerable error is the major factor in maintaining an almost negligible variation in the jury size despite the 10-fold increase in population size in each case. As a side issue, it may surprise the judiciary to note that juries composed of as few as 10 members do hold some merit as representative samples of relatively large communities.

The formula for determining sample size is:

$$n = \frac{Nz^2(0.25)}{Ne^2 + z^2(0.25)}$$

where  $N$  is the population,  $z$  is the z-score associated with the degree of confidence selected, and  $e$  is the tolerable error.

Tolerable Error %	Population (community)								
	1000			10 000			100 000		
	Confidence level %			Confidence level %			Confidence level %		
	90	95	99	90	95	99	90	95	99
1 (99% representative)	965	975	985	7314	7979	8694	21 399	27 808	39 963
10 (90% representative)	214	277	400	265	370	624	272	383	661
25 (75% representative)	42	58	96	44	61	105	44	61	106
34 (66% representative)	23	32	54	23	33	57	24	33	58
49 (51% representative)	10	15	25	10	15	26	10	15	26

**Table 2.** Minimum jury size required based on community population, confidence level and tolerable error.

Although the parameters of 34% (tolerable error) and 90% (confidence) are used as the jury size selection criteria in the VJ trials in this study, it should be noted that applying a larger tolerable error (49%) coupled with a maximum confidence level (99%) results in a similar minimum required sample (jury) size of 25, 26 and 26 for the three nominated populations of 1000, 10 000, and 100 000. On this basis a minimum jury size of even 23 members can claim a reasonable degree of legitimacy in representing the community from which they are drawn. Most public surveys aim for a tolerable error of  $\leq 10\%$  and so samples containing several hundred individuals are common. Being somewhat more tolerant of the potential error estimate allows a much smaller sample size to be used in practice.

#### 2.4.2 Jury selection

The primary goal in jury selection is broad representation by capable people able to act as agents of their constituency. The jury should preferably consist of people free of significant personal conflict of interest, who are willing and able to understand the issues and consider them purposefully.

The only way to avoid the appearance, if not the actuality, of selecting jurists on the basis of which interest group they may represent, is to select them as randomly as possible. This may be difficult to achieve in practice. Unless some degree of compulsion is associated with jury service (as is the case in judicial trials) it is unlikely that jurists will volunteer in numbers adequate to truly reflect a randomised process. As duress contradicts the principles of democratic theory, an alternative set of premises is required upon which to base jury selection.

An established procedure for considering the objectivity of jurists is *voir dire*, a negotiation process by which potential jurists are rejected if they are suspected of bias. A similar procedure may be applied in the case of VJs. The first step in applying this principle is to limit the geographical location from which potential jurists are drawn. Brown, Peterson and Tonn (1995 p256) suggest the best approach is to select people from the area primarily affected by the public decision to be made. On this basis jurists are most likely to have a significant degree of prior knowledge of the issue and this may limit the amount of background briefing to be provided. It also meets the overriding requirement of democratic theory that the impacted public should be adequately represented in the decision-making process.

The next step in the process is to ensure, as far as is possible, that those jurists who are selected do actually represent the community from which they are drawn. In the absence of randomness, those people who volunteer to participate in the VJ exercise should, at least, be considered relatively representative of their community. To enable this, the jurists should be chosen on the basis of their ability to represent certain key objective criteria. The simplest way to achieve this is to ensure that selected characteristics of the jury are reflective of those same characteristics in the community from which they are drawn. These characteristics may include for example, gender ratio, age distribution, employment status, nationality, and qualifications. In most cases these types of data are available for all levels of public administration, from the national down to that of the local government area. So, for example, if the influence of the public decision to be considered is confined to a local government area, then the jury chosen should reflect some set of specific socio-demographic characteristics as they exist within that area. The objective of this process is to limit the potential for public criticism of such a non-random approach. In other words, the community can feel confident that they have been fairly represented in the exercise.

An appropriate method of ensuring statistical representation is to apply a z-test of proportions to each characteristic employed as a filtering mechanism. Such a test will determine if (at some pre-determined level of confidence, typically  $\alpha = 0.05$ ) the jury sample reflects the same characteristic in the subject population (community). Such a test is most appropriately applied to characteristics that are known to be present in proportions of 20% or greater, particularly where small samples are involved. The evidence for this is contained in the fact that for a jury of 25 people, the particular characteristic will vary by 4% (1/25) for each additional person who holds it. So aiming to achieve full representation for characteristics that exist in the subject population at a level lower than 20% may be difficult to achieve in practice. For example, if employment status is selected as a filtering characteristic and the local unemployment rate is 8%, then having 2 unemployed people in a jury of 25 will adequately represent this characteristic. But having one (4%) or three (12%) will act as a distortion to the

representativeness of the jury. It may be more appropriate to simply combine several sub-groups. On this basis broadening the criteria to include those who are employed as one group, and combining all of those who are not currently in the workforce (including the unemployed, retirees and other non-participants) as another is one example of such pooling.. Generally, the figures associated with the employment example tend to fall in the ratio of 60:40 and, as such, are not so overly subject to the sensitivity of smaller proportions.

The more fundamental question of how to initially attract potential jurors remains. One method is to advertise for participants in the media. The major problem with this is that self-selection has the potential to result in a disproportionately high response from those who may have a vested interest in the outcome of the jury process. Other alternatives are to invite participants from a sample of the electoral roll or from some other community listing such as the telephone directory. Although as many as 40% of telephone subscribers have 'silent' numbers, the directory does provide a large database from which potential jurors may be drawn. A random number selection process is appropriate if the telephone directory is the preferred source of participants. The nature of questions put to the jurors in the VJ setting is such that they are most likely to be required to answer on a 'per household' basis, and therefore it may be appropriate to encourage only one person per household to respond to the invitation. The sponsors are also likely to require jury members to be of a particular minimum age and so the invitation should stress this. As part of the invitation process it is also important that selected socio-demographic characteristics of the potential jurist are captured. This will enable a filtering of the number and type of respondents. A form should be included in the invitation letter seeking demographic information from the potential jurist in each household. The purpose is to gather the information required to form a 'pool' of respondents from which to select a jury with characteristics that most closely reflect the impacted community. Because respondents are often unwilling to confirm their financial position in these types of mail surveys, it may be more appropriate to avoid asking such questions and instead focus on less intrusive characteristics including, for example, gender, and level of educational qualifications. Once the responses have been collated, a list of willing potential jurors can be drawn. If a large enough group of people has responded, there should be no major difficulty in ensuring that, for the selected criteria, a strongly representative jury can be formed.

#### 2.4.3 The decision rule

Alternative decision rules include majority, consensus, unanimity, and central tendency. Majority, consensus, and unanimity are based on voting or agreement. Central tendency is a rule based on statistical analysis of the responses of individual jurors. Voting or agreement are

most appropriate for questions of choice among alternatives, and central tendency is suited to estimates of a numerical magnitude.

Majority rule requires that a specified proportion of jury members vote in favour of a given outcome. It may be a simple majority (50% +1), or special majority, for example two-thirds. The unanimity rule requires that all jury members vote in favour of a given outcome. It allows no dissenting votes and no abstentions. Consensus is reached when any members of the jury who do not favour the outcome advocated by other members also choose not to oppose it.

Measures of central tendency include the mean and median. The mean may be appropriate for larger juries which have the capacity to generate normally distributed results. For smaller juries the median may be more appropriate to avoid the unintended effects of outliers.

Unlike judicial trials, VJs have the flexibility of determining their own decision rule. One important proviso is that the rule should always be decided upon prior to the commencement of the jury deliberations to ensure that members are not inclined to attempt to influence the deliberations of other jury members in a close decision.

#### 2.4.4 Constituency

One question central to the efficacy of any liberal democratic approach (including VJs) is who should be represented in the process? Or, as Beatley (1994) asks, what is the extent of the moral community to which ethical consideration in decision-making is due? It is from this community that any representative sampling should occur. This 'community' is the group that may also be called the stakeholders. Except in circumstances where broad-scale elections occur, the preferences of *all* (usually adult) members of any stakeholder group tend to remain unknown. For this reason sampling from this group should theoretically ensure that firstly, the sample is relatively representative and, secondly the stakeholder group is appropriately delimited.

A more difficult task is to determine who are the actual stakeholders associated with any publicly-impacting activity. This issue is compounded by the fact that many such activities have spatial and temporal impact scales that are not readily confined to a particular geographic location at a single point in time. For this reason, Sagoff's *consumer* versus *citizen* dichotomy is useful. If 'consumers' are strongly centred on self-regarding activity then this suggests that their responses to questions about public issues will be flavoured by a desire for relatively short-term, localised gratification. 'Short-term' in this context can be taken to mean within a period

of say, up to 20 years, but in any case no more than the individual's expected lifetime. Conversely, 'citizens' adopting a more community-regarding role should, according to Sagoff's description, consider their preferences on a much larger time-scale extending, possibly, to several generations, and well beyond the confines of their local geographic location. On this basis it appears entirely possible that the same participants in a values jury setting may be able to offer two sets of responses to a hypothetical public good scenario. Firstly, as stakeholder group representatives who might best be initially described as consumers and secondly, as participants adopting a citizen mode of thinking. In practice, the participants may even be instructed to play one role of the other. Any clear differences in the responses would then provide a causal link between the role of the valuer and the magnitude of their valuation. This is an important advantage that the VJ process may have over alternative stated-preference methods. CV methods for example, traditionally do not hold a great capacity to determine or direct the role that participants are playing. As a result, the question posed by Blamey, Common and Quiggin (1995 p263), "respondents to contingent valuation surveys: consumers or citizens?" remains beyond the analytical capacity of most typical CV analyses.

#### 2.4.5 Information

One of the principal advantages of the VJ as an alternative to opinion polls or typical CV exercises is the potential to provide jurors with a considerable amount of information upon which to make their decision. Empanelling a jury for anywhere from a few hours up to several days, depending on the scope of the issue, allows a much more rigorous educational experience than is often possible in most other forms of public survey. The jury may be provided with information in a range of forms including reading material, video or audio presentations, as well as direct representations by experts and stakeholder groups. Unlike a traditional judicial jury, members of a VJ should be encouraged to ask questions and, within reason, request additional information if considered necessary. They should also be allowed to discuss the issues amongst themselves. According to Habermas's criteria, dialogue is the most vital element in a communicative process such as a values jury.

Clearly, there must be rules and procedures that control the jury process and the manner of presentation of material. To facilitate the information flow, an impartial moderator is necessary. The role of this person is critical. A biased moderator has the potential to disturb the jury process and unduly influence the collective decisions of the group. For this reason, the person selected for this task should be mature in their attitude, sympathetic to the operation of the jury process, and mindful of the significance of their role.

#### 2.4.6 Authority

Legal juries carry weight in part because they are officially sanctioned. Although only advisory, a VJ could still exert substantial influence if a particular jury exercise was sponsored by a public agency. Statutory or judicial sanctioning of the process would obviously add strength to its claims for recognition and respectability. The trials executed as part of this research hold no statutory or other support, and are principally conducted solely for academic purposes.

### **3 THE VALUES JURY TRIALS**

#### **3.1 Structure and function of the trials**

In most social and political systems, the decisions of public authorities are justified by appeal to some kind of rationality, most commonly economic, legal, or political. Under these circumstances the information provided by research into the collective preferences of the impacted public acts as a form of input into the decision-making process. Such information is seldom an end in itself. More usually it is intended to be incorporated into a broader analysis such as a CBA or EIS. Similarly, as a model of public values research, the values jury process represents an attempt at capturing aggregated choices for inclusion into these analyses. VJs are therefore fundamentally a means-based - rather than ends-based - form of public input into policy and planning decisions. They are intended to rely on their own rational appeal, but are unlikely to be used as instruments of final arbitration. The underlying appeal of VJs lies in their economic - rather than their legal or political – rationality. Ostensibly, it is not the task of VJs to confirm legal or political preferences, although there is possibly no particular reason why they could not be adapted for such purposes. Instead, they are more appropriately aimed at confirming social and economic preferences. Due to the clear objective of VJs to appeal to economic rationale, the framework for describing the methodology for the trial of the model is intentionally based on micro-economic logic. But the perceptible distaste that the impacted public often demonstrate for analyses that are cast solely in economic terms requires a broader framework to be considered if it exists. In the case of the VJ process, it is also aimed at meeting specific rational discourse criteria: a requirement that is intended to clearly differentiate it from other forms of public preference gathering. Whatever the purpose for convening the jury, it remains a primary objective for it to derive outputs that reflect the public's sentiment toward social equity and distribution issues arising from the topic in question. It is also obliged to do this under conditions that reflect fairness and competence in the related discourse process.

Based on these economic and discursive criteria, the purpose of this chapter is to provide an analysis of the framework within which the VJ trials were intended to function. To facilitate this, the chapter is divided into three parts. Firstly, the conditions associated with drawing the juries together are described. Following this, an overview of the Habermas-Webler discursive criteria model as applied in this study, is provided. Finally, the application of the stated preference economic approaches adopted in this research are described.



### 3.1.1 Matters for consideration by the juries

A series of values juries was convened in mid-1999 in the rural locations of Warren, Dubbo and Mudgee in central-west New South Wales, along with a further one representing the urban interests of Sydney. The primary focus of the four juries was to consider a particularly topical environmental issue and to reflect the intensity of concern for the matter by way of a jury verdict. Convening the juries also enabled a range of 'local' issues to be considered. The main issue of concern though, was the impact of irrigation water usage on the quality of the Macquarie Marshes.

Water managers are frequently required to make trade-offs between allocating water for consumptive and in-stream uses. These trade-offs are often difficult to make because of a lack of information about the monetary values associated with in-stream use of water for purposes such as recreation, water quality, and riverine and wetland health (Morrison and Kingsford 1997). Information about the value of these environmental goods is scarce because they are generally not traded in conventional markets, and even if they were it is a matter of contention as to how adequately the prices paid may reflect the intensity of public interest in them. This can be contrasted with the much greater availability of information about the monetary value of water for consumptive uses including irrigation.

The Macquarie Marshes are an ephemeral wetland on the Macquarie River in north-west New South Wales (Figure 3). They were originally the largest wetlands in the state, with an area of approximately 5000 km<sup>2</sup>. A Nature Reserve, contained within the Marshes, is listed as a wetland of international importance under the Ramsar Convention. The Marshes have a number of significant environmental features. They provide a habitat for many species of migratory waterbirds and act as a filter for downstream water quality. They also provide a high quality grazing location for sheep and cattle enterprises.

In 1967 Burrendong Dam was commissioned on the Macquarie River and a large area of irrigated agriculture has since developed. A total of 4400 people are estimated to be employed in the Valley as a result of the existence of irrigated agriculture (Morrison, Bennett and Blamey 1998). The extensive use of water for irrigation has meant that much less water now reaches the Marshes compared to pre-irrigation flows. As a result there has been a decline in the size and health of the Marshes. Since 1967 the area of the Marshes has fallen from 5000 km<sup>2</sup> to around 1000 km<sup>2</sup> and weeds have affected much of the remaining wetland. The average frequency of waterbird breeding events has reduced from every year to every four years, and the number of endangered and protected bird species using the wetlands has fallen from 34 to 12 (Morrison,

Bennett and Blamey 1998 p4). For a more thorough review of the Macquarie valley, the role of irrigation, and the significance of the Marshes refer to Appendix 4.

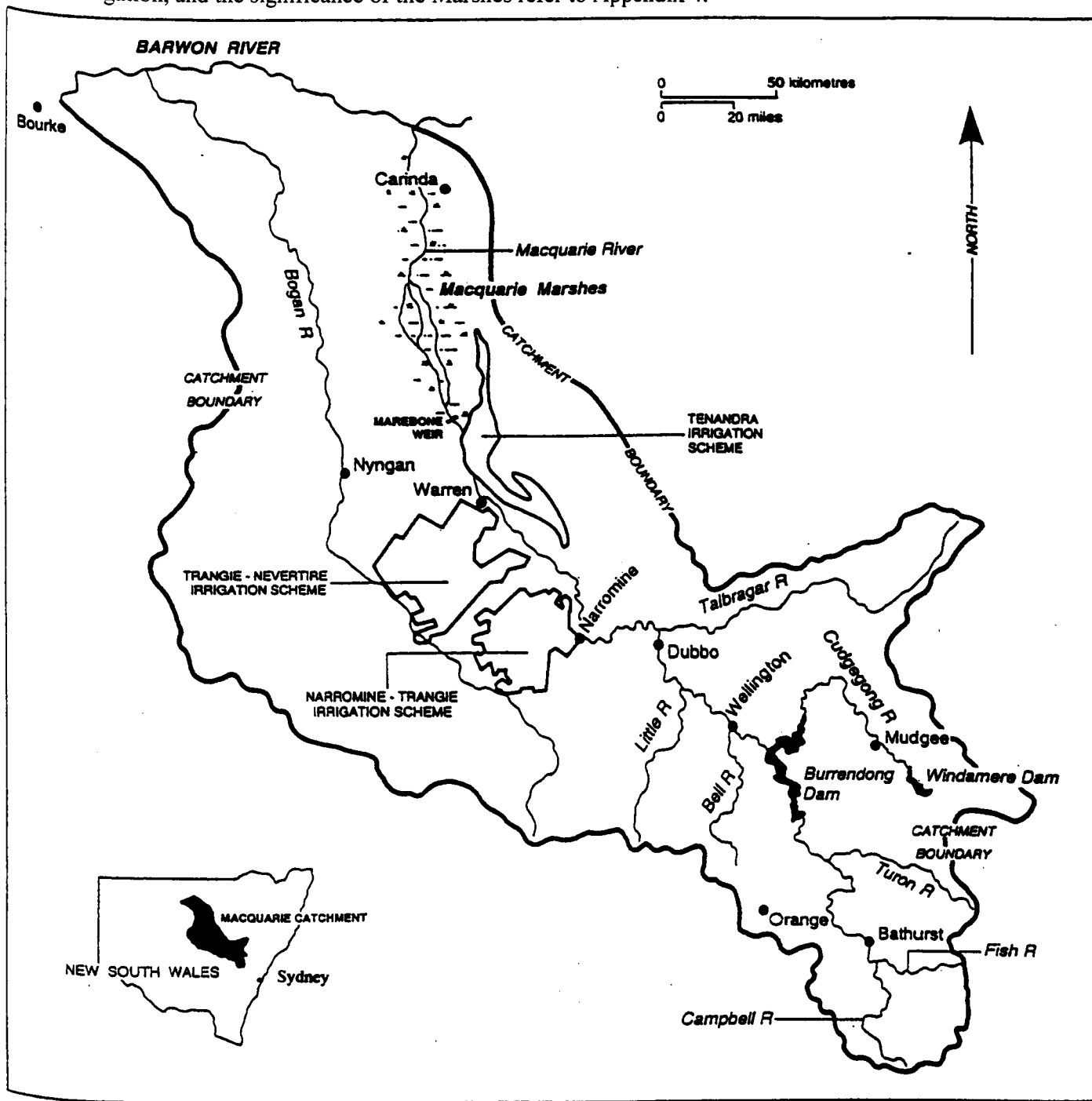


Figure 3 The Macquarie Valley

A growing disaffection between irrigation-based farmers and people claiming a public interest in maintaining the health of the Marshes has developed in recent years. The underlying issue involves a conflict between the overtly non-complementary ideals of development versus conservation. Supporters of the irrigation industry claim that it provides a considerable employment benefit to the region and a potential for enhanced economic development.

Conversely, environmental proponents voice concerns about the impact of water usage on the long-term viability of the Marshes. The conflict has led to a considerable amount of high profile lobbying and environmental activism which has extended to well outside the bounds of the Macquarie Valley. Both sides of the debate have been pro-active in advocating their cause to politicians and public authorities at all administrative levels. Fundamentally, the Macquarie Marshes issue is one of values in conflict. It represents a prime example of the discord between market-driven values and axiological values; between value in exchange and value in use; between positive and normative values, and; between teleological values and deontological values.

Morrison, Bennett and Blamey (1998) recently conducted a novel investigation into the willingness-to-pay (WTP) expressed by Sydney-based residents for environmental improvements to the Macquarie Marshes. The study was innovative in that it represented a creative application of the Choice Modelling (CM) technique to a public good issue. CM is a method of capturing non-market values and is applied in a similar manner to a contingent valuation (CV) survey. In their research, Morrison, Bennett and Blamey conducted a door-drop survey of 318 respondents regarding their WTP for a range of potential Marsh improvements. The scenarios presented to the participants in the survey and their mean WTP are summarised in table 3.

	Wetland area (km <sup>2</sup> )	Waterbird breeding intervals (years)	Endangered and protected species present	Irrigation- related employment (jobs)	Household WTP to achieve alternative scenario (\$)
<i>Current scenario</i>	1000	4	12	4400	n/a
<i>Scenario 1</i>	1400	3	16	4400	48.75
<i>Scenario 2</i>	1400	3	16	4300	34.04
<i>Scenario 3</i>	1800	2	20	4400	102.62
<i>Scenario 4</i>	1800	2	20	4250	73.19

**Table 3.** *Alternative Macquarie Marshes scenarios and respondent's WTP to assist with achieving them.* (Adapted from the Choice Modelling survey conducted by Morrison, Bennett and Blamey 1998).

While the CM approach adopted by Morrison, Bennett and Blamey attempted to resolve many of the standard limitations of stated preference surveys, they acknowledged that problems relating to bias, implausibility and information issues were of greatest concern in designing their questionnaire instrument (Morrison, Bennett and Blamey 1997). Despite this, their results are

informative in that they provided a frame of reference for eliciting measures of cardinal values that could be adapted for application in the VJ exercises. As a primary focus for the present study, the Marsh scenarios devised by Morrison, Bennett and Blamey were also presented to the jurors in the VJ trials for their consideration.

In addition to assessing the quantum of values associated with the Macquarie Marshes, it was also prudent to use the opportunity provided by convening the juries to establish the level of concern felt by the participants relating to other – possibly contentious – matters. Specifically, jurors were requested to express their strength of concern about a range of ‘local’ issues. Each of these matters was hypothetical, but parallels exist between them and the decisions that have to be made in many communities on a regular basis. The particular hypothetical issues related to:

- Acquisition of an additional dialysis machine for placement in the nearest hospital to meet the growing demand for such a device in the community.
- Removal of a dialysis machine from the nearest hospital to satisfy the needs of another community, leaving the local health service with only one machine. The scenario assumed that the one remaining machine would be inadequate to cope with the growing demand and that a surplus of patients would need to have their dialysis requirements met by some other hospital in the region.
- Demolition of a local historic building, with a resulting loss to the architectural landscape of the vicinity.
- Removal of a local war memorial. Its relocation being based on two further unrelated hypothetical scenarios, namely: for commercial benefit to a property development site, and; to make way for the installation of important communications equipment required by the local ambulance authority.

These scenarios were constructed as representations of the generic range of socially-impacting activities typically facing local communities on a regular basis. Public authorities hold the responsibility of routinely making decisions about these types of issues with limited input from the affected population. Often, the decisions are subject to some degree of public dissent. But because most models of public administration provide for only limited input from the impacted community, policy makers can commonly claim that they ‘did their best’ based on the degree of public interest shown.

### 3.1.2 The location of the jury sittings

One of the fundamental tenets of public participation is that the ‘moral community’ impacted by the decision to be implemented should be fairly represented in the process (Beatley 1994). Often due to the vague spatial and temporal dimensions involved, a clear delineation of those likely to be affected is difficult. Despite this, it is reasonable to expect that some attempt should be made to act inclusively when implementing a public choice process. Morrison, Bennett and Blamey appear to have overlooked this in conducting their CM trial. They limited their Macquarie Marshes survey to Sydney-based respondents. On this basis they can be criticised for avoiding the possibility of confronting those who may – even on a hypothetical basis – have had to consider their future without an irrigation-related job if several of the alternative scenarios ever actually eventuated. In this case, the most obvious place to seek out the primary stakeholders was within the Macquarie Valley. This is not to deny that forms of attachment are also likely to be held by people residing at distances away from the Valley. It may have proved a great deal more beneficial to their research if Morrison and his co-researchers had focussed on the preferences of the most obvious stakeholders in their study and incorporated the Sydney responses as a useful form of comparative or supplemental data.

It is precisely because the scenarios constructed by Morrison, Bennett and Blamey have direct application to the Macquarie Valley that the present study used sites within the Valley for execution of the values jury trials. It was considered important to obtain the impressions of a wide distribution of residents and so locations representing the upper, central, and lower reaches of the Valley were identified as ideal sites for trialing the juries. Of the ten major towns and cities within the Valley three were chosen to represent the interests of the people residing in the region: from the upper valley, Mudgee; from the central area, Dubbo, and; from the lower valley, Warren. To this was added a Sydney sample. A random selection process derived Strathfield, in Sydney’s inner western suburbs, as the representative municipality from which the views of metropolitan stakeholders would be elicited. In each case it was the opinions of the broad body of residents associated with the location that was sought. To encourage this, invitations to participate in the jury process were distributed to residents drawn from throughout each location’s local government area rather than limiting the study to the views of only urban dwelling respondents. This approach increased the probability that the views of rural residents within the Valley would not be overlooked.

### 3.1.3 The jury questionnaire

As part of the jury process, participants were issued with a questionnaire which was to be completed throughout the duration of the trial and returned to the moderator at the conclusion of the exercise. The questionnaire format was an abridged version of the instrument shown in Appendix 4. The range of questions incorporated into the instrument included ones to identify participant's behaviour, beliefs, attitudes and attributes. Behaviour questions were included to establish what people *do* under specified circumstances. Belief questions provided jurors with an opportunity to identify what they thought was *true* or *false* regarding particular issues. Attitude questions were the primary focus of the instrument and were intended to elicit participant's normative preferences about what they *thought* was desirable. Attribute questions were designed to capture information about the participant's personal background socio-demographic characteristics.

To facilitate the orderly functioning of the trial, all questions for completion by the jury members were delivered orally by the moderator, with the answers noted in the appropriate space provided in the instrument. This ensured that jurors had limited incentive to outpace the rate of delivery of the questions. It was also intended to encourage an attentive approach by the jurors so that they could more fully participate in the discursive aspects of the trial proceedings. An exception to the moderator-delivered question format was provided in the introductory and concluding components of the questionnaire. These sections required participants to indicate various socio-demographic characteristics of themselves, and provide an analysis of their perspectives about the operational aspects of the jury process, respectively. Appendix 4 contains the moderator's version of the instrument.

The questionnaire instrument was divided into several sections. The introductory component (section 1) asked participants to identify their personal details with regard to several characteristics including: gender, age, place of birth, residential status (buying or renting), employment status, highest level of post-school qualification, and environmental sympathies. Apart from the issue of environmental sympathies, the collection of these details was for comparative analysis with similar data collected in the most recent census of the particular local government area. For each location data from the 1996 national census were the most contemporary available to provide for the comparative statistical analysis required. Specifically, the data enabled a z-test of proportions to be conducted to determine if the characteristics of the jury sample represents a fair reflection of the same parameters in the (local government) population. The question on environmental sympathies was included to provide a

grounding for the extent to which jurors may oscillate between pro-environmental and pro-development attitudes when confronted with a range of public goods issues.

By way of introduction to the axiological orientation of the trial, the next section of the questionnaire required participants to provide an estimate of the market value of their place of residence. For many people this is a difficult task, particularly if they are renting or are simply unaware of the current conditions of the market. For this reason, the follow-on questions related to the amount of insurance premium paid by them each year to cover their dwelling, or, in the case of lessees, their contents. These questions were followed with ones relating to the amount that each of the home-owning (buying) participants would demand to entice them to sell their properties immediately. The differential between the current market value and the price required to encourage them to dispose of the property should, *ceteris paribus*, represent the measure of above-market axiological value. Similarly, for those not familiar with their residence's market value, or who were currently leasing properties, the insurance question was structured to encourage participants to identify a maximum ceiling on their premiums they would be prepared to pay rather than leave their assets uninsured. This question was premised on similar grounds to the market value one to the extent that any additional premium willingly paid by the individual to limit their perceived loss could be treated as a reflection of the personal value – above market value – of the particular asset. This was intended to provide a relatively uncomplicated introduction to the possibility that axiological values may co-exist with market-based ones. It was also intended to confirm to the jurors that their role was to consider the measure of such values – if they were perceived to be present – with regard to each of the scenarios about to be presented to them.

One important feature of the trials was to provide considerable opportunity and encouragement for jurors to make comments on the questionnaire about their sense of commitment to the specific topic being addressed. In this way a qualitative assessment of the intensity of the comments could also be used as a form of iteration reflecting the participant's actual underlying strength of attachment. Throughout the instrument 18 of the questions put to each jury simply asked for their free-form commentary on the specific issue being considered. An interval-based (0-4) scoring system was devised to identify the intensity of commentary (Table 4).

<u><i>Commentary</i></u>	<u><i>Score</i></u>
No comments	0
Brief general comments (e.g. 'This question is difficult to answer.')	1
Brief normative comments and extended general comments (e.g. 'This should not be allowed' or, 'This topic is very important to this community because...')	2
Extended normative comments and lengthy general comments	3
Lengthy normative comments (e.g. 'The government is always trying to...and this must not be allowed to occur, otherwise...and if this happens the public should...')	4

**Table 4.** *Scoring for free-form commentary responses*

This system of scoring would then enable a correlational analysis to be conducted between these qualitative assessments and the valuations provided for each of the individual topics under consideration.

One vital issue of stated preference surveys that is often overlooked is that budget limitations exist for all respondents. People's willingness to pay is necessarily constrained by their ability to source funds. In the absence of measurement of this limiting factor, CV (and similar) WTP surveys run the risk of confounding the results of their research. If participants in such a survey provide statements of payment intent that exceed their ability to actually pay, then some doubt must be cast on the reliability of the findings. Conversely, if willingness to accept is considered the more appropriate measure, then the problem of budgetary constraints is avoided. Throughout the values jury trials, magnitudes of both WTP and WTA were used to derive estimates of collective preferences. For this reason it was important that some indication of the juror's budgetary limitations was revealed. The typical means of achieving this is to ask respondents how much they earn on the assumption that a correlation may exist between this figure and their willingness to pay for a worthwhile cause.



This study has taken a slightly different, and novel, approach. The basis for deriving a household budgetary constraint was to identify the actual level of payments made by jurors for ostensibly worthwhile public causes in the preceding twelve-month period. Not only does this avoid the potentially difficult issue of participants identifying their income levels to relatively unknown researchers, it also provides a direct measure of people's *actual* willingness to contribute to such purposes. To achieve this, the next section (Section 3) of the questionnaire asked jurors to indicate details of their payments for social and community-benefiting activities in the previous year. These questions were supplemented with others that asked the participants to identify their preferred ranking of public causes from amongst the following: welfare, sporting, religious, educational, environmental, and health. In particular, this would enable the strength of environmental commitment to be identified relative to other – albeit constrained – issues of public concern.

Although the analogue for the values jury process is the judicial model rather than the public opinion one, it is a clear objective of VJs to derive cardinal measures of public preferences. This, quite obviously, is not necessarily the objective of criminal or civil jury-based trials. In the majority of judicial cases the charter of the jury is to determine guilt or innocence beyond reasonable doubt, or on the balance of probabilities. Under these circumstances, the jury's role is limited to informing the judiciary of its decision in nominal binary measures: guilty or not guilty, responsible or not responsible, and so on. Such measures do not transfer readily to public preference research. To confirm this, a brief section (Section 4) of the values jury questionnaire provided the participants with a dichotomous choice (guilty/not guilty) question that was followed with another that required the jurors to identify, on an interval scale, *how* guilty. The purpose of this was to indicate to the participants that many public issues are not easily reduced to pro- or anti- positions, and that it may often be important to also identify the relative strength of preferences associated with particular issues. The dichotomous question put to each of the juries: 'Was OJ Simpson guilty?'. The recent series of court cases involving Simpson and his role in the death of his wife and her acquaintance, made this a question that was constructed to take advantage of its high media profile. The follow-on question took the form of, 'how guilty?' using a Likert-type scale of measure.

Payment vehicles for collection of amounts nominated in stated preference surveys may take a variety of forms when public authorities act as the collecting agents. These include income tax imposts (such as the Medicare levy), increases in land and water rates, and user-pays levy premiums (Industry Commission 1997). There is evidence that people are generally sceptical of payment vehicles that involve government authorities such as taxation departments (Bennett and Carter 1993, Blamey 1996, Bennett, Blamey and Morrison 1997). The typical suspicion is that

any increase in the level of charge is unlikely to be reversed even if the social issue it relates to is actually ameliorated in the future. It appears that people are much more favourably disposed to making donations to what they consider to be worthy social causes, utilising a charitable (or similar) entity as the collection authority, than they are to granting public authorities approval to act as the collecting agents (for what may be exactly the same cause). To identify whether this aspect of people's WTP strategy was significant, the next section of the questionnaire asked the jury participants to indicate the maximum level of financial support they would give to a Federal Government-controlled fund to be used exclusively for environmental purposes.

Sections 6 and 7 are associated with valuing the social benefits of a kidney dialysis machine to the local community. This process was structured in two distinct parts. Tversky and Kahneman (1981) suggested that people treat apparently equal gains and losses asymmetrically, giving the latter much more weight in their decision-making than the former. In other words, the loss of \$1 is treated as a disproportionately greater psychological misfortune than the gain of an equivalent amount. These two sections of the questionnaire were structured to test for the presence of a public asymmetric value function in conjunction with the valuation of a public good (kidney dialysis machine). Jurors were asked to identify their intensity of concern associated with both options, namely: valuation under conditions requiring acquisition of an *additional* unit to meet the needs of the local hospital, and; valuation under conditions of a threat of removal of an *existing* machine from the hospital to a distant location. Intensity of concern was measured in the WTP format, by asking participants firstly, for a measure of their willingness to pay to purchase an additional unit and, secondly, their WTP to avoid the loss of a machine already located in the local hospital. This involved asking the jurors to respond to the questions as if they were to pay the nominated amounts personally. A novel supplement to this line of questions was to ask the jurors to act as consultants on behalf of their community and to recommend an amount that should be levied on *all* households. The purpose of this measure was to establish whether people acting as advocates, and holding responsibility for negotiating on behalf of a constituency, are prepared to offer to pay more or less than the community they are intended to represent.

By way of introduction to the kidney dialysis machine questions, jurors were asked to identify their willingness to support the acquisition (Section 6) or loss (Section 7) of a machine on a dichotomous choice (yes/no) basis. The relatively raw nature of this referendum-style question was highlighted by an earlier section of the questionnaire (Section 4). The problem is that the underlying intensity of preference is difficult to measure using such a basic form of questioning. As a means of comparative analysis, each of the following sections of the questionnaire (Sections 8-12) also begins with a similar type of question. In each case, this question is

followed by a series that seeks to identify the intensity with which the 'yes' or 'no' vote has been cast, using both WTP and WTA measures.

The subjects for consideration throughout many of the following sections concerned actual sites and features in proximity to the jury's community. These were targeted specifically to ensure that only 'local' issues were raised in the jury trials to avoid any potentially adverse outcomes that may be associated with valuing public assets far removed in time or distance from the participants' locality. For an example of the problems that may arise in valuing distant situations refer to the Imber, Stevenson and Wilks (1991) contingent valuation survey of the Kakadu Conservation Zone. To determine how well known each of the specific locations was to the values jury participants, they were provided with a Likert scale to indicate their degree of familiarity with the sites in question. The primary purpose of this was to enable correlations between familiarity and intensity of preference to be established.

Section 8 asked jurors to consider their attachment to an actual historic building located in their district. The hypothetical scenario presented to the jury indicated that the building was under threat of complete demolition, despite being structurally sound, and the Local Government authority was legally unable to decline the application. Such a situation is not particularly unusual especially when a heritage listing (or similar limiting action) has not been implemented. The mode of value elicitation was the WTA expressed by the jury. This was premised on the notion that the loss of any significant – historic or social - asset may also involve the diminution of a community benefit, and the most appropriate measure of the extent of the damage is by way of the amount that would need to be paid to the impacted community to off-set the loss. Supplementary questions attempted to reveal the jury's intensity of attachment to this specific building based on there being other similar buildings in the vicinity which also provide a reasonable representation of the era in which this one was constructed. In other words, the supplementary questions provided for the construction of a set of indifference curves based on there being more than one building of this type in the vicinity.

Measuring the intensity of preference for an asset or feature that has a public interest component in isolation from others with similar properties can sometimes make the estimate prone to a number of biases. In particular, symbolic, and part-whole bias can emerge (Appendix 2). The most obvious means of limiting the potential for such biases to arise is to ensure an adequate flow of information and dialogue occurs so that participants in any value elicitation exercise appreciate the relative importance of the asset in its broader context. This is one of the functional advantages of the values jury process over other forms of stated preference techniques such as traditional mail-out type CV surveys. Beyond this, another important value

estimate also becomes possible. By ensuring that the jury is fully informed of the existence of other similar types of public-interest assets, indifference mapping becomes possible. Indifference maps are a form of economic assessment that measure the relative value of an asset (X) against another (Y) for which it may be at least partially substituted. Its usual application is to inform as to how much of X people are willing to forgo to acquire a quantity of Y. From this, marginal rates of substitution can be calculated. If, instead of substituting the *quantity* of Y, the (market) *value* of it is used in the mapping exercise, then the relative value of X can be established. Or, more importantly, the marginal value of X may be determined for any given quantity. Although this form of analysis is seldom undertaken in contingent valuation research, its use may avoid some of the more typical problems of starting-point bias often associated with such surveys (Appendix 2). To enable indifference maps to be created for a number of the values juries issues, participants were asked to identify the \$-value of an item (or group of items) that each felt would provide an equivalent off-setting social benefit should the public good in question be lost (Table 5). This format was applied to Sections 8-11 of the values jury questionnaire (loss of the historic building, and two alternative scenarios relating to the removal of a local war memorial). For each of the focal issues of these sections of the questionnaire the juries were encouraged to estimate their measure of loss by reference to a list of potential community requisites. The question put to the juries required them to sum up the value of the items from the following list that, together, would adequately compensate the community for the loss of the public feature.

Indifference curve mapping is given added benefit when a zero point is identified. This enables the particular curve to indicate at what level the provision of an extra unit of a good generates no additional value to the potential users. This has considerable applicability to the estimation of marginal values for environmental public goods. For example, an asset or feature may hold significant public value simply because of its uniqueness. If more than one example of the item exists, its uniqueness diminishes. As is the case with public goods that are in abundance such as air or ocean water, the marginal value can fall to zero. The same is also expected to hold for most other types of public goods including historic buildings and war memorials. For this reason Sections 8-11 of the questionnaire also required the jury to identify zero points at which the number of similar significant environmental features allowed the jurors to acknowledge that the demise of the particular building or memorial did not represent a significant loss to the community.

<u>Item</u>	<u>Market value (\$)</u>
memorial plaque	500-1500
blood pressure monitor	750-2000
school PC (computer)	2000-3000
medical records computer	2500-4000
memorial monument	5000-15 000
portable cardiac defibrillator	10 000-12 000
electronic medical microscope	18 000-25 000
ultrasound imaging machine	25 000-30 000
operating table	30 000-50 000
endoscopy probe	50 000-70 000
public Olympic-size swimming pool	75 000-100 000
x-ray imaging machine	400 000-600 000
C.T. scanner	900 000-1.1M
cardiac monitoring equipment	1.0-1.25M

**Table 5.** *Cost price for selected public goods*

Sections 9 and 10 of the questionnaire referred to a local war memorial and presented two scenarios. In the first (Section 9), the war memorial was hypothetically targeted for removal from a public space for incorporation as a point of attraction at the entrance of a new residential sub-division. In the second (Section 10), the monument was also targeted for removal but for a very different reason. It was suggested in this scenario that the local ambulance authority required the structure to be transferred to an alternative site to allow important communications networking to proceed. In both cases re-location was the goal, but the motive for displacement differed. The purpose of this part of the exercise was to determine if the magnitude of public values has a potential to vary based not on the action itself but rather, on the underlying motive. If so, then there may be every reason for developers to continue to offer platitudes to achieve their goals, and for environmentalists to continue to pursue activist roles in response.

Sections 9 and 10 were also intended to fulfil a further objective. The issue of determining the net present value (NPV) of future cashflows remains topical in public value debates. The magnitude of financial value of a good is usually considered to bear a relation to the size of its future potential net income streams. It is most commonly applied in assessing the commercial value of an asset (often some form of real estate) that may not be readily identified by the usual range of market transactions. The calculation relies on the estimation of two critical

components: the identification of potential net future cashflows, and the determination of a discount rate. Applying an appropriate discount rate to the cashflows will generate a NPV. This is the usual form of the calculation. Conversely, if the NPV is known, and the cashflows can be estimated, then the discount rate can be revealed. This is not the typical commercial form. But in the context of valuing a public asset it may have an application. If people are asked to nominate an amount they are willing to pay on an annual basis to provide for the retention of a public feature, they are technically identifying an income stream that can be associated with the particular good. In addition, by expressing the magnitude of their willingness to accept they are assigning a current value – NPV – to the good. The only factor left unidentified is the implied discount rate. But by having two of the three, the third can be calculated. On this basis a social discount rate can be estimated when people reveal both their WTP and their WTA. Sections 9 and 10 ask both types of questions to enable a discount rate to be determined for the public asset (a war memorial monument) under consideration.

The issues surrounding water management and its impact on the Macquarie Marshes were introduced in Section 11. The questionnaire provided jurors with a brief overview of the conflict between the goals of conservation and the demands of irrigated agriculture in the Macquarie Valley. The introduction was intended to be concise for a specific reason. As with each of the topics considered by the juries up to this section of the program, the intentionally localised nature of the matters for consideration meant that the jurors were deliberately provided with only a modest amount of background information on the issue in question. The suspicion being that if such issues were to be raised for the attention of a functional jury, convened by say, a Local Government authority, the need for provision of detailed background information may be diminished. Local participants evaluating the impact of local issues are possibly less likely to require extensive briefing on such topics. For at least three of the juries – Warren, Dubbo and Mudgee – the issues surrounding the Marshes and irrigation management *were* very local. For the Sydney jury, this was not the case. To test for the effect of the injection of additional information, the questions raised in this section of the survey instrument were repeated in Section 15. Section 15 was presented to the juries following an extended courtroom-type examination of the conflicting issues. Effectively, the jurors' views on the Marshes issue were elicited on a 'before and after' basis, to establish if there was likely to be some causative impact on their verdict based solely on the introduction of an information variable. The questions actually presented to the juries in Section 11 focussed on the alternative Marsh scenarios devised by Morrison, Bennett and Blamey (1998). The jurors were asked to identify their willingness to pay to achieve the outcomes provided in each of the scenarios.

In a departure from the scenarios described by Morrison, Bennett and Blamey, Section 12 of the questionnaire asked jurors to assume that the current scenario was actually one of the alternatives, specifically, scenario 4. It provided for the highest level of waterbird breeding, species representation, and wetland area. But the employment level was only 4250 jobs. Jurors were then asked to indicate their views on whether they considered an increase in jobs to 4400 represented adequate social compensation for an alternative scenario that resulted in a reduction in wetland area, decline in the number of species, and decrease in the frequency of waterbird breeding. They were also asked to identify the additional amount of compensation due to the broader community for the resultant contraction in public amenity. The purpose of this set of questions was to establish to what extent the WTP (budget constrained) values derived in the previous section contrasted with the (unconstrained) WTA ones expressed in this section. In each case the WTP questions in Section 11 related to alternative scenarios that either held the environmental benefits steady or improved them. Conversely, employment rates were held stable or fell. In Section 12 the alternative construction was used: environmental impacts were all negative, and employment levels improved.

The problem of parties adopting strategic behavioural positions in negotiation processes is one that is noted in many issues involving environmental conflict (see, for example, Walker 1994, Papadakis 1996). The typical problem is that at least one of the contesting parties refuses to make any concessions on the often-illusory belief that the others will capitulate. In Section 13 of the questionnaire participants were asked to suppose that throughout the jury process thus far they held the role of chief negotiator on behalf of their community. They were then asked to indicate whether, in general, they would be willing to negotiate a compromise on their estimates of public value if they were requested. The purpose being to determine if participants may have been inflating their estimates of value for strategic reasons.

Sagoff (1988) introduced a concept of human motivation that has received considerable attention in environmental literature in the past decade. His theory was not altogether innovative, and relied heavily on the earlier work of Harsanyi (1955) Sen (1970, 1977) and Margolis (1982), but it did coalesce a disparate group of ideas into a reasonably simple concept. He suggested that the choices people make about difficult issues are often driven by ethical beliefs tending to place the person in the role of a 'citizen'. He contrasted this with the self-interested decisions that people make when they act purely as 'consumers'. Blamey, Common and Quiggin (1995) concluded that the behaviour adopted by individuals when responding to broader social issues is generally reflective of a citizen mentality, where desirable public goals are the motivating force and override simple consumer preferences. To test for the influence of a citizen disposition in the jury participants, Section 14 of the questionnaire presented an

abridged version of Sagoff's *citizen* versus *consumer* dichotomy to the jurors. Sagoff's definition is typically summarised by the following extract.

‘As a citizen, I am concerned with the public interest, rather than my own interest; with the good of the community rather than simply the well-being of my family...As a consumer...I concern myself with personal or self-regarding wants and interests; I pursue the goals I have as an individual. I put aside the community-regarding values that I take seriously as a citizen, and I look out for Number One instead’ (Sagoff 1988 p8).

With this definition highlighted to the jury, each of the participants was instructed to adopt, as far as was possible, a citizen mode of thinking and then asked to re-consider their value sentiments toward a select group of questions for which they had already provided answers. The particular questions re-presented to them ranged from the issue of their environmental donation strategy (Section 5) and the need for an extra kidney dialysis machine in the local hospital (Section 6), through to the matter of the loss of the historic building (Section 8). Mindful of the fact that participants may have been motivated – possibly by a degree of embarrassment - to return to the answers they had already provided to make adjustments, all questions throughout the survey instrument were presented orally rather than being in a written format within the questionnaire. The purpose of this was to avoid the temptation to change any of their earlier responses once the *consumer* versus *citizen* characterisations had been delivered to the particular jury.

Prior to proceeding with delivery of Sections 15 and 16 of the questionnaire, each jury was exposed to an extended debate (courtroom style) about the issues that concerned the two sides of the Macquarie Marshes' water usage conflict. An expert witness representing the interests of the water users and another acting as advocate for the environmental movement made presentations to the juries. Each was then permitted to cross-examine and challenge the case presented by the other. Finally, the jurors were given an opportunity to question the two presenters at length to clarify any of the issues raised by either of them. At the end of this process the jurors were again presented with the same questions about the Marshes they had previously encountered in Sections 11 and 12. The purpose of the debate and open forum was to establish if, in the case of the Marshes, the intensity of the positions initially identified by the jurors (in Sections 11 and 12) altered significantly as a result of the introduction of additional information. The additional information was generated by a dynamic process of interaction between the speakers themselves, and also between the jurors and the speakers.



The final section of the questionnaire (Section 17), required the participants to reflect on the exercise that they had been party to throughout the trial. This component used a summative participatory process evaluation approach, providing the jurors with an opportunity to identify the benefits and deficiencies of the values jury model. The format of questions used to elicit the participant's assessments was based on an adaptation of Weblar's discursive standard criteria.

#### 3.1.3.1 *Valuation question format*

There is a continuing lively debate in contingent valuation literature about the use of closed- and open-ended valuation questions. Closed questions generally ask respondents to say whether they would accept or reject a particular magnitude of payment. For example, would they be willing to accept the commitment to pay \$1 or \$2 to avoid some event occurring that may have detrimental consequences to the environment. If they respond positively to the latter amount, the process is iterated (\$2 or \$3, or possibly some other amount) until the respondent ultimately indicates a maximum payment willingly provided. Alternatively, open-ended questions simply ask the person to nominate a maximum amount they would be willing to pay, without exposure to any specific pre-determined figure or range of figures. The argument in favour of the closed-ended approach centres on the notion that if the CV model is intended to reflect ordinary economic behaviour, then buyers normally accept or reject a seller's offer price. Rejection may lead to a counter-offer, but at least the original price establishes a form of benchmark. It is generally argued that with novel public goods such as environmental features, it would be difficult to expect people to identify a 'value' without some type of benchmark (Schuman 1996). The counter argument suggests that closed-ended questions have an inherent starting point bias (Appendix 2) which may tend to infer a value in the mind of the respondent. On this basis valuation surveys using this format are sometimes criticised for the arbitrary and limited nature of the dollar amounts proposed (Schuman 1996 p88). Closed-ended questions may also lead to 'yea-saying' (Kanninnen 1995), where participants simply continue to say 'yes' because they are never required to make the actual payment (or accept the compensation in the case of WTA formats). This is also a form of *free riding*. The main reason for using open-ended questions instead, is to avoid imposing any initial value so as to allow people to produce whatever value they wish. Unfortunately, free riding is also possible under these circumstances. Despite this, as Schulze *et al.* (1996 p108) point out, it would seem more appropriate to avoid the problems associated with the closed-ended format altogether, by simply using an open-ended framework (refer also Bohm 1995, Desvousges, Hudson and Ruby 1996). On this basis, open-ended framing was adopted throughout the values jury trials.

Although all of the value-related questions included in the instrument were open-ended, a novel departure from the traditional format was also introduced into the trials. As noted previously, jurors were exposed to a list of potential community-benefiting goods whose acquisition costs were included in their description. Jurors were then asked to refer to this list to estimate what value (to the community) would be lost if the specified hypothetical public-impacting action was undertaken. Or, more correctly, what amount of compensation the community would require to off-set the benefits forgone by the loss of the public good. This was obviously only applicable to the WTA questions. For the jurors the unfamiliar task of placing values on goods such as war monuments was expected to be challenging simply because of the lack of relative pricing structures. The community 'wish list' was intended to provide jurors with a framework for estimating the relative value of the goods forgone. On this basis, one or more goods could be chosen as adequate compensating replacements for the public good hypothetically forgone, and thereby reveal the quantum of the loss to the local community.

#### 3.1.4 Validity and reliability of the instrument

There is an element of intuitive appeal in the attractiveness of stated-preference estimates of value, relative to non-monetary estimates. If broadly accepted values for public goods can be established, they can support forms of analysis such as CBA much more strongly than public values based on attitudes or other qualitative measures. It is a fundamental objective of the values jury model that it assist in providing such estimates. In applying the VJ methodology to the determination of stated preference estimates of monetary values issues of validity and reliability consequently arise.

The values jury model is not isolated in dealing with the concerns of validity and reliability. Over a relatively brief period contingent valuation techniques have been called upon to answer value-related questions of increasing difficulty under controversial circumstances. The most notorious being the CV survey of the impact of the *Exxon Valdez* oil spill in Prince William Sound, Alaska, in the late 1980's. In Australia, the most widely referenced example of a major CV survey was conducted by Imber, Stevenson and Wilks (1991) regarding the Kakadu Conservation Zone. Both surveys were heavily criticised after their findings were released for a wide range of reasons (Brunton 1991, Moran 1991). This included serious questioning of the validity and potential biases of the instruments.

The controversy about how to improve the efficacy of stated preference estimates of value continues. While most participants in the debate agree that the ability to generate valid and reliable instruments to measure values would improve authorities' ability to manage public assets, there is much less agreement on how to accomplish the task (Bjornstad and Kahn 1996). For this reason the CV research community remains focussed on devising modes of operation of the technique that have widely accepted integrity.

Validity refers to whether an instrument measures what it is intended to measure. Several types of validity are usually distinguished: face validity, criterion validity, content validity, predictive validity, and construct validity. Of these, face validity is the one most easily satisfied, particularly under circumstances where participants are able to seek clarification of concepts and issues throughout the duration of the exercise. Face validity refers to whether the questions appear to be sensible ways of asking people their opinions. Under the operating conditions of a values jury, where dialogue is encouraged, this type of validity is the one most readily attainable. It is one of the roles of the moderator to ensure that jurors are aware of the nature and scope of the question being addressed. The rules of discursive interaction are intended to encourage people to raise their concerns if they are unclear as to the focus of the question. Oral presentation of each question by a moderator is also likely to limit any potential confusion about the purpose of a particular question. For this reason an experienced and sympathetic moderator is necessary.

Criterion validity is concerned with how well the novel approach answers questions compared to existing, well-accepted measures. If peoples' answers on both the new and established measures are highly correlated this is taken to mean that the new measure is valid. There are two inherent problems with this approach. Firstly, it must be assumed that the existing measure has established its own validity. The most obvious comparison to be made with the results generated from a values jury exercise are with those arrived at by the only other widely-recognised stated preference technique for assessment, a contingent valuation survey. The controversy that has surrounded the use of the CV model for the past four decades suggests that without it firmly establishing its own validity, CV is likely to remain a questionable source for generation of criterion validity for the values jury model. The second problem is one that is similar to the first and concerns the fact that for many social science issues there are simply no existing well-established measures against which to check the new form of assessment. While the values jury concept represents a hybrid model adopting characteristics that are drawn from both the behavioural disciplines as well as the economic sciences, it is difficult to suggest that its antecedents have firmly established the basis for acceptance of its claim for this form of validity. For example, much of welfare economic theory is premised on the primacy of the

demands of the consumer. But under circumstances where the market does not provide an adequate reflection of peoples' sentiment, or when people have cause to act as *citizens*, economic theory provides limited information for comparison with elicitation models such as the values jury. In fact, much of the continuing debate about the efficacy of CV models is based on a similar range of arguments. In the extreme case, it may prove to be a new model that can more effectively capture the measure in question than any particular well-established technique.

One indirect option to indicate criterion validity is to expose the new form of measure to 'criterion groups'. These are groups of people whose responses to questions may be expected to vary dependent on the social grouping they represent. If, for example, the members of a politically conservative group provide conservative answers to a line of questioning, and radical group members provide opposing views then this may provide some form of evidence for the measure's criterion validity (de Vaus 1995 p56). In an earlier pre-test of the values jury model (Lally 1999) two groups of people representing a particular community were invited to attend. While one of the groups was drawn randomly from the vicinity, the other was composed of people who had confirmed themselves as 'environmentalists' (either by their own personal acclamation, or by their participation in activist groups in their community). The pre-test found that the environmental group gave consistently higher estimates of value regarding a range of local environmental issues. Such a finding goes some way to providing evidence of criterion validity for the values jury model. But it also raises other issues relating to measurement validity that remain a challenge to both the VJ technique and to the application of the contingent valuation method. Principally, the use of criterion groups provides an indication of the existence of internal validity, but it does not contend well with the need to demonstrate external validity. While internally-consistent measures are important, enabling the measure to be compared with externally verifiable measures presents a problem for the economic output of the values jury model. To a large extent it is the same problem that besets the CV technique in that there is, as yet, no non-controversial measure of people's public valuation preferences that can be satisfactorily compared to those explicitly revealed by some other measure, including, for example, the market. This remains a fundamental challenge to all forms of stated preference valuation techniques.

Content validity emphasises the extent to which indicators measure the various aspects of the concept. Once again, the debate surrounding the efficacy of contingent valuation plays a role. The central issue appears to be whether measures of value (willingness to pay and willingness to accept) actually measure the true extent of people's willingness. Fortunately, the concepts of WTP and WTA are derived from standard economic theory. On this basis, the issue of whether questions framed in such a way actually reveal a measure of people's WTP or WTA is much

less controversial than other validity issues. On a broader scale, the content validity problem may be considered to be one of whether stated preference measures are valid in general *at all*. If, as is generally acknowledged in the literature, this is not a major point of contention, then it is unlikely that content validity is a significant issue in the application of payment measures in values jury exercises. The more important issue surrounding WTP and WTA is which of the two is the more appropriate measure of value, and this is *not* necessarily a question relating to the issue of validity.

Predictive validity refers to the ability of an instrument to reflect the actual future actions of the person being questioned. This is a problem for most types of stated preference techniques because the major argument for employing such measures is due to the fact that there are no other means of recognising what the person's intended actions may have otherwise been. In other words, such techniques only capture intensities of normative preferences, not actual performances. In fact, in most cases, there is no mode of delivering the payment to or from the respondent. Stated preference elicitation techniques simply identify the intention, they do not capture the action. A form of indirect test is to compare questionnaire responses about contributions to public causes with actual donations. Champ *et al.* (1997) undertook such an exercise and found that the contingent donations pledged substantially overestimated actual donations. It is this type of result that continues to cast doubt on the ability of CV measures to capture real intentions. By implication, values jury questions framed in a similar way to those of a CV exercise are likely to be subject to doubts concerning predictive validity.

Construct validity refers to how well a measure conforms to theoretical expectations. Usually, this form of validity involves the association of a focal measure with a number of other measures, often on the basis that no single measure is definitive, but each may contribute to the overall efficacy of the primary measure. Once again CV surveys seldom acknowledge the importance of this form of validity. In the case of the values jury, the central measure in question is the strength of peoples' attachment to a public feature measured by WTP and WTA estimates. In the trials undertaken in this study supporting evidence for the estimates of value was provided by several supplemental measures, namely: assessments of the level of personal affinity with the feature in question, and assessments of the intensity of participant's feelings toward each hypothetical issue as indicated by the qualitative strength of the comments they provided in the questionnaire. Supporting evidence of jurors actual *ability* to pay (and not just their *willingness* to pay) was also captured in the questionnaire to provide a context for the monetary measures of WTP. Referendum-style questions were also employed in the questionnaire to establish the correlation between dichotomous choice nominal preferences and cardinal measures of the same preferences. It may be argued that Arrow's (1951,1963) *general*

*possibility theorem* makes any attempt at capturing such cardinal measures of interpersonal preferences somewhat irrelevant. Nevertheless, until researchers uncover a more effective mode for capturing these measures it is unlikely that such elicitation exercises will be avoided. After all, the concept of revealing the level of peoples' cardinal utility and preference intensity continues to make intuitive sense, especially if the metric used is suitable for incorporation into a cost-benefit analysis.

Reliability of the instrument refers to its ability to obtain a similar result on repeated occasions. A question may be unreliable due to poor wording, or even as a result of a variation in intonation or inflexion by the person delivering it. The simplest means of overcoming such a potential problem is to incorporate a form of triangulation into the instrument. This is an iterative process, but it has a disadvantage in that it may make the respondents wary of the intentions of the convening authority if the participants believe that too much repetition is involved in the questioning. An alternative approach is to ask questions with a similar intent but in a different manner. To a large extent this was the purpose in asking jurors to provide comments reflecting the intensity of their feelings about each of the issues throughout the VJ exercise. By correlating the measure of monetary intensity with the level of qualitative intensity of feelings toward each topic a perspective on the true strength of preference could be gleaned.

Reliability is also enhanced by pre-testing. In the case of the values jury, two trials were undertaken in mid-1998 (Lally 1999). As a result of these, several modifications were made to the instrument. In some instances, it was merely the wording of questions that was altered. In others, questions were completely eliminated. The pre-testing also provided a means of assessing a degree of criterion validity. A critical issue also affecting reliability is the potential for 'interviewer bias'. This may arise when the person conducting the face-to-face component of the exercise inadvertently (or possibly, deliberately) influences the responses of the participants. This is most easily overcome by conducting the exercise on a 'blind' basis where all participants complete the tasks by following written instructions, effectively eliminating the need for an 'interviewer'. The obvious disadvantage in this is that the discursive element of the operation is completely removed, and this may result in an even greater injustice to the public participation process. The more feasible alternative is to ensure that the interviewer – or, the moderator, in the case of the values jury – is well trained and sympathetic to the needs of the setting. In this case, the pre-test provided the opportunity for the moderator to hone his skills prior to undertaking the final VJ trials.

Finally, to avoid the unintended consequences of 'no response' or 'don't know' answers, all jury participants were encouraged to complete every question. The discursive focus of the VJ

process was intended to encourage jurors to ask for clarification from the moderator if they were unsure of the intention of a question. On this basis it was estimated that the rate of response rejection would be minimised. Ultimately, the more complete the responses were, the greater would be the reliability of the instrument.

#### *3.1.4.1 Bias and the questionnaire instrument*

Closely aligned to the problems of assuring validity is the issue of minimising bias. There is a strong suspicion running through the economic literature that despite their intuitive appeal, non-market estimates of public good values are inherently unreliable (Bennett, Blamey and Morrison 1997). Contingent valuation estimates of peoples' aggregated preferences are the primary target for much of the criticism. The major contention being that such valuations are a reflection of respondent's reactions to hypothetical scenarios (hypothetical bias) with limited capacity for any form of objective verification possible. The problem becomes circular in that the usual purpose for conducting such surveys is precisely because there is no identifiable market for establishing the magnitude of value of the good in question.

The hypothetical nature of the process is not the only criticism of such valuation surveys. Many other forms of bias may also impact on this type of research. Scope bias, for example, is claimed to pervade many hypothetical valuation surveys and can demonstrate its presence in a number of forms (Baron 1996). Insensitivity to scope occurs in the extreme when people identify a value for one unit of a public good that remains invariate regardless of the total number of similar goods they are asked to value. Such bias exists, for example, when people indicate the same total willingness to pay for the clean-up of a single contaminated site as they would for all contaminated sites. Under these circumstances it may be claimed that people's budget constraints limit their capacity to pay for any more than one (or a few) such activities. Conversely, it could also indicate that people may confuse the part with the whole (part-whole bias) and use their full potential budget on over-valuing the initial unit of benefit to the detriment of subsequent units. Scope bias may also appear in the form of an 'adding-up effect' (Diamond *et al.* 1993). Under these circumstances, people responding to a question about the value they assign to good X, and then to good Y separately, indicate a value for X and Y together that is no greater than for either of them individually. A more thorough overview of the range of biases potentially affecting hypothetical valuation studies is contained in Appendix 2.

The challenge for a novel technique such as the values jury is to ensure that it recognises the potential impacts of issues including bias as a basis for presenting a fresh set of options to the research community. As far as the present study is concerned, the major question is how the

values jury model may contend with as much of the recognisable bias potential as possible. Based on the broad range of biases identified by Mitchell and Carson (1989), a means of contending with most is offered in Appendix 2, in the context of how they may apply to the VJ process.

The promise of the model is most obviously aligned with its use of dialogue. In this, the role of the moderator becomes critical. So, for example, the moderator holds the responsibility of reminding the jurors that they each has only a limited personal budget to apply to the hypothetical WTP scenarios. This is to ensure that the potential for scope bias is minimised. Also vital is a leading role for advocates and expert opinion. Many of the biases affecting the range of CV methods relate to issues which, with adequate discussion between organisers, lobbyists, and participants, could be minimised and possibly even avoided. For many of the problems associated with the use of the traditional CV model the lack of face-to-face contact (in phone and mail surveys), or inability of interviewers to adequately reflect the organiser's requirements (resulting, possibly, in interviewer bias), provides strong evidence of a need to change the orientation of such methods. Ultimately, it may prove to be much more beneficial to reveal the public preferences of a smaller, well-informed group of participants, than those of a larger less-informed group.

#### 3.1.5 Design of the trials

The values jury trials were conducted in four locations with a sample of approximately 25 residents present in each jury. The questionnaire instrument was provided to each group with appropriate adjustments for localised issues. Specifically, where the topic being addressed was the historic building (Section 8) and the war monument (Sections 9 and 10), actual local structures were used as the focus. As a result, the nature of some of the features being assessed differed to an extent in each location.

The trials were conducted in a function room of a registered club in each case. The setting was intended to be comfortable without providing any undue distractions. Each jury was empanelled for a day (9.00 a.m. to 3.00 p.m.), and provided with morning tea and lunch. The flow of the day's events was controlled by the moderator (being the researcher), who attempted to ensure that strongly interactive dialogue was encouraged. The debate about the Macquarie Marshes was played out by two informed experts representing their particular interests in the issues. The same two advocates presented their previously-prepared cases to each of the juries. This whole process was repeated in each of the locations.



Although this type of field-based experiment encourages participants to feel comfortable and adequately informed about the jury exercise, it was impossible to hold all factors constant for each panel. In each case extraneous factors will have played a moderating effect. For example, issues such the climate of the room, the influence of fellow participants, the variation in the way the experts delivered their Marshes presentations, and even the explanations of the nature of the jury's tasks provided by the moderator, are all likely to have had some degree of impact on the jurors deliberations throughout the exercises. For this reason the process is more appropriately defined as a quasi-experiment than as a pure experiment.

The overall design reflected a cross-sectional approach, utilising data obtained from the four locations on a one-shot (single point in time) basis. Some of the tests within the design were conducted to assess the influence of an introduced factor such as the impact of participants adopting a *citizen* mentality (Section 14) and the test for the influence of the expert opinions pertaining to the Macquarie Marshes issues (Sections 15 and 16). Both of these required a repeat of information previously provided to the juries. On this basis, the majority of the exercise was undertaken on a single-factor independent groups design. But, for those components of the process that involved re-presentation of information already provided to the jurors, the design was effectively altered to a single-factor repeated measure independent groups design.

The use of such designs makes more sophisticated statistical analysis possible, but it should also be noted that participant's background socio-demographic information was also collected enabling a descriptive research approach to be adopted for at least a proportion of the data.

### 3.1.6 Jury size

The decision concerning the minimum jury size is one of compromise between pluralism, practicality, manageability and statistical representativeness. Several reports on the implementation of the related model of *citizens' juries* indicate a high degree of sponsor and participant satisfaction with juries of up to 25 members (Carson 1994, 1995, Coote and Leneghan 1997, Crosby 1995, O'Hara 1996). It appears that juries of this scale do not necessarily present a major logistical problem from a management perspective, and neither are they so large that discursive interaction is unduly constrained. It was also noted previously (Table 2) that juries composed of 23-26 members provided conveners with a 90-99% confidence level that at least 51-66% constituency representation was possible. These rates held true even for relatively large communities. On this basis the target for the values jury trials was a membership of at least 23 jurors from each location.

### 3.1.7 Jury selection

With the exception of the Macquarie Marshes all of the issues presented for consideration by the juries were 'local' in character. This was a deliberate measure to limit the potential for confounding in relation to spatial significance. In the pilot study of the values jury the participants were asked to 'value' a war monument in their local vicinity, and then to do the same for one situated in a location far removed from the jurors' place of residence. Although the structures held the same symbolic significance, the axiological value of the local monument was found to be an order of magnitude greater than the distant one (Lally 1999). This provided evidence that people are willing to demonstrate a considerably greater attachment to familiar local public features than to similar ones in more distant locations. This inverse relationship between peoples' level of attachment and the physical distance to the feature suggested that substantial errors could result from attempting to elicit value assessments from people regarding unfamiliar features, especially if they are located in remote places. One of the objectives of the final jury trials was to ensure, as far as possible, that jurors were being exposed only to features of their immediate environment to avoid such potential problems. Another important reason to concentrate on local matters was to limit the amount of background briefing required about the hypothetical issues being assessed. In addition, it was considered fundamental to the public participation process that the jury represented the 'moral community' that would be most obviously impacted by the hypothetical scenarios. In each case the scenarios were structured to represent examples of the generic range of actions and decision options faced by local authority policy makers. On this basis the stakeholder community in each case was in fact most appropriately defined as including all residents of the Local Government area.

In line with most other public surveys, the jury selection process concentrated on seeking 'per household' representation in the study. In other words, having more than one participant volunteering from any single household may have unduly affected the results of the process, particularly as far as jury representativeness was concerned. The 'per household' orientation of the study was also reflected in the nature of the questions addressed, which typically asked 'on behalf of your household, how much would you pay...?'. Table 6 shows the number of households located in each of the subject locations. As each participant was to represent a total household it was also considered appropriate to ensure that only adult (18 years or older) members of households were invited to participate in the process.

<i>Location</i>	<i>No. of households</i>
Warren	1235
Dubbo	12 677
Mudgee	6295
Strathfield	8744

**Table 6.** *Number of households per jury location.* (Source: Australian Bureau of Statistics 1997)

Several critical sampling issues were resolved as a result of implementation of a pilot test in mid-1998. The most important aspect being the likely response rate from the distribution of invitations. Two pilot juries were commissioned. The first was drawn from the community defined by the particular (Dubbo) Local Government area. The second was composed of a select group of individuals who had indicated a strong pro-environmental orientation. The response rate in the community-based pre-test equated to 11.6% of a total of 265 invitations. Of the 31 people who provided a positive response, 26 (10% of total invitees) actually attended the community-based jury. The second pilot jury was conducted on an invitation-only basis to establish criterion validity of the instrument. As such, it was not subject to a distinct response rate. Various statistical tests of proportions confirmed that, for several selected socio-demographic characteristics, the pilot community-based jury was largely reflective of the broader constituency they were intended to represent (Lally 1999). It should be noted that the tests were for a reasonably narrow range of characteristics. In the final jury trials this range was expanded.

The sampling procedure adopted in the final jury trials was a modified systematic stratified approach. In the case of both the community-based pre-test and the final jury trials, the sources of names for inclusion in the invitation list was the relevant telephone directory. A direct approach to Telstra confirmed that, on average, only 60% of private telephone subscribers allow their names to be listed in the directory. On this basis, the directory provides only a partial – although substantial – reflection of the total number of phone users in any community. Similarly, in many locations telephones may not be connected to every household. On this basis the directory is not necessarily comprehensive in listing all households in any location. Despite this, it still provides a vast and convenient database from which to draw invitees. This is particularly relevant when it is considered that a values jury may only be composed of as few as 23 members. Stratification in the sampling procedure was therefore based on the variable of name placement in the respective telephone directories. The systematic element of the sampling procedure involved determining the percentage of subscribers to be contacted from within the stratified population of local telephone subscribers. On the basis of the results from the pilot

test, it was estimated that approximately 8% of invitations would not be delivered to their intended address, primarily due to insufficient address details or incorrect identification in the telephone directory. Additionally, it was likely that up to 20% of the final acceptors would fail to attend for various reasons on the day of the particular trial. Allowing for the non-delivery rate coupled with the non-attendance of a portion of the final acceptors, and a likely overall response rate of 10%, a total of 325 initial invitations were posted to residents within each of the four Local Government boundaries. The target was to achieve an actual attendance rate of around 25 people per location.

<i>Location</i>	<i>Estimated number of listed telephone subscribers (60% of households)</i>	<i>Initial invitations</i>	<i>% of listed telephone subscribers to be invited</i>
Warren	740	325	44.0
Dubbo	7600	325	4.3
Mudgee	3800	325	8.5
Strathfield	5200	325	6.3

**Table 7.** *Jury invitation rates by location.*

Once the quantum of total invitations per location was determined the rate of systematic sampling (sampling fraction) could be estimated. This was equivalent to the inverse of the ‘% of listed telephone subscribers to be invited’ (as per table 7), rounded to the nearest whole number. For example, in the case of Warren the sampling fraction was 1/2, and for Dubbo it was 1/23. For convenience, the start was not randomised, it was simply the first appropriate address in the directory. Table 8 shows the initial response rate to the value jury invitations in each location.

<b>Location</b>	<b>Invitations sent</b>	<b>Total delivered* (% of total sent)</b>	<b>Invitations accepted (% of total delivered)</b>
Warren	325	306 (94)	33 (10.8)
Dubbo	325	316 (97)	48 (15.2)
Mudgee	325	295 (91)	51 (17.3)
Strathfield	325	280 (86)	40 (14.3)
<b>Total</b>	1300	1197 (92)	172 (14.4)

**Table 8.** *Delivery and response rates to values jury invitations, by location.*  
 (\* Remainder were ‘return to sender’.)

A critical feature of the values jury model is the need to ensure that the jury membership reflects the constituency it is intended to represent. There is an infinite number of ways in which this might be assessed. For example, on the basis of household income, rate of church attendance, or any other basis for which objective data are available. In this study, issues of personal or household income were avoided to minimise respondent suspicion about the purpose of the jury exercise. To avoid the potential for such scepticism, the following socio-demographic indicators were used on the basis that they were informative to the jury process but largely non-threatening to the participants: gender, age, country of birth, residential status (own/buying, renting), employment status, and highest level of post-school qualification. The majority of the parameters were suitable for data capture in statistically nominal variable form (for example, male/female, born in Australia/born overseas). For those parameters known to exist at a rate of less than 20% in the selected populations, the categories were amalgamated so the results would not be unduly affected (except in cases where it could not be avoided, for example, 'country of birth', which is heavily biased toward Australia). For example, secondary data (Australian Bureau of Statistics 1998) indicated that unemployment rates in the study locations ranged from 4.4% (Strathfield) to 6.6% (Warren). Each person in a jury of say, 25 people represents a 4% proportion of the total sample and so if even 3 jurists indicated that they were currently unemployed (representing 12% of the sample) it may have an unintended detrimental impact on the analytical component of the study. To avoid this, the potential jurists who were actually unemployed were included in a combined category titled 'not currently employed', which included, for example, retirees and full-time students. It was considered vitally important to ensure that the rate at which various socio-demographic parameters existed in the local community was fairly reflected in the characteristics of the jury attendees, otherwise the process could be criticised for attracting an unrepresentative sample of the constituency. For this reason potential jurists were asked to complete a brief questionnaire relating to their personal characteristics as part of the invitation acceptance. If adequate acceptances were received then this would enable the respondents to be culled so as to arrive at a final jury membership that most appropriately reflected the characteristics of the community. Fortunately, the initial acceptance rates exceeded those of the pilot study (averaging 43 in each location, representing 14.4% of the invitations delivered), enabling some selective culling to occur. Table 9 shows the characteristics of the initial respondents to the values jury invitation in each location.

Location	Total initial acceptances	Median age (years)	Gender		Country of birth		Residential status		Employment status		Highest level of post-school qualification <sup>2</sup>	
			M	F	Aust	O/S	Own / buy	Rent	Empl	Not curr. empl	Nil +	Tech +
Warren	33	57	14	19	30	3	21	12	10	23	26	7
Dubbo	48	48	18	30	45	3	36	12	27	21	30	18
Mudgee	51	50	19	32	41	10	45	6	24	27	26	25
Strathfield	40	54	17	23	29	11	26	14	18	22	14	26
<b>Total</b>	<b>172</b>	<b>53</b>	<b>68</b>	<b>104</b>	<b>145</b>	<b>27</b>	<b>128</b>	<b>44</b>	<b>79</b>	<b>93</b>	<b>96</b>	<b>76</b>

**Table 9.** *Selected characteristics of the initial acceptors to each values jury.*

(1. People working part-time or full-time are included as 'employed'. 2. Nil+ represents no formal qualification or basic vocational training only. Tech+ infers technical trade qualification through to university post-graduate level.)

Based on the objective of achieving a final jury membership of approximately 25 people, and mindful of the potential for a 20% non-attendance rate, a target total of 30 invitees per jury was established. In each location the number of initial respondents indicating a willingness to attend enabled some selective culling to proceed to derive a target invitation list. Using a modification of the *voir dire* strategy the socio-demographic characteristics of the initial respondents were trawled to ensure that those of the final 30 invitees fairly reflected the rates of those characteristics in the respective Local Government areas. A critical factor in this process is that although the 30 invitees ultimately selected were considered to provide a reasonable reflection of the particular community, the 20% non-attendance rate maintained a potential to have a distorting effect on the composition of the actual juries. The impact is assessable using a statistical test (z-test) of proportions.

Details of actual jury attendance are provided in Table 10. Importantly, the estimate of a 20% non-attendance rate amongst final invitees proved to be correct, resulting in an average membership of 25 people in each jury. This was comfortably within the 23-26 attendance target range.

Location	Initial acceptances	Final invitees	Actual attendees	Non-attendance rate (%)
Warren	33	30	24	20
Dubbo	48	30	26	13
Mudgee	51	30	25	17
Strathfield	40	30	25	17
<b>Total</b>	172	120	100	17

**Table 10.** *Jury membership by location.*

Socio-demographic characteristics of the final attendees are shown in table 9 in the following chapter. Also included is a comprehensive analysis of how satisfactorily the composition of the juries reflected the communities they represented.

### 3.1.7.1 *Juror attendance payments*

A critical finding of the values jury pilot study was that despite their interest being aroused by the initial invitation letter, very few of the attendees would have participated in the exercise without some form of financial (or possibly, in-kind) incentive. The pilot test jury sat for approximately 2½ hours and each received an honorarium of \$20. The invitation letter highlighted that this payment would be made in appreciation of their participation and that it held no further obligations (to avoid suspicions about the purpose of the exercise). Given the relatively modest attendance rate in the pre-trial (26 people) from an initial mail-out of 265 invitations, it was evident that jurors in the formal jury trials would also expect payment to encourage their attendance. The pivotal question in this was what measure of payment would be necessary to attract a wide range of respondents – including those who may be prepared to forgo a day's work commitments – to the jury exercise. Based on any juror payment being an honorarium, and therefore not subject to the usual taxation considerations associated with employment arrangements, the payment was assessed as having to be at least equivalent to the *pro rata* post-tax amount received by the 'average' employee within the trial locations. At the time of undertaking the jury trials the median national wage equated to approximately \$31000 per annum, or \$15.90 per hour (Australian Bureau of Statistics 1998). The *prima facie* tax (including Medicare levy) applicable to this quantum of wages is approximately \$7000, representing 23% of the total pre-tax income level. On this basis, the net hourly post-tax rate equates to \$12.30. Each jury exercise was designed to proceed over a 6-hour period (9.00 a.m. to 3.00 p.m.) and so a payment of \$12.30 per hour, totaling \$73.80 (rounded up to \$80), was

considered to be a reasonable incentive for a broad cross-section of participants to be encouraged to attend.

### 3.1.8 The decision rule

One of the inherent, and unavoidable, characteristics of contingent valuation exercises is hypothetical bias. It tends to limit the precision of econometric estimates and is evident in the *free rider* problem. It is an issue that is closely aligned with 'warm glow' bias, where, due to the hypothetical nature of the exercise, respondents can attempt to act strategically by offering WTP/WTB bids that may totally misrepresent the value of the good in question. The most usual way for these biases to be identified is for an implausibly large result to arise from the survey. In many cases the existence of such biases can be at least partly revealed by a review of the differential between the mean and median bid amount. Often, the variation is so great that the difference is more appropriately measured as a multiple of the median rather than just as a mere percentage variation of it. Many CV studies covering a variety of issues report such findings, including Carson *et al.* (1992) (mean \$94, median \$31), Holmes and Kramer (1993) (mean \$22.86, median \$4.21), Kahneman and Knetsch (1992) (mean \$135.91, median \$50.00), and Silberman, Gerlowski and Williams (1992) (mean \$15.10, median \$9.26). In each case, the mean is considerably larger than the median due to the impact of a portion (<50%) of the respondents nominating a figure much higher than the one indicated by the majority of participants. The incentive to act strategically by over-inflating value estimates appears to be the main cause of the differential between the two measures. On this basis, the more conservative approach is to use the median estimate.

Another reason also exists to utilise the median bid as a fairer representation of 'average' aggregated preferences. Black's (1958) *median voter theorem* claims that under voting conditions, the most preferred outcome of the median voter is the only alternative that can gain a simple majority against all other alternatives. Re-stated, it suggests that if the public is willing to accept that simple majority voting (50% + 1) is a satisfactory way of revealing the general will, as is the case with many forms of elections, then the preference of the median voter is the one that will prevail against all other alternatives. The standard procedure for applying the median-voter model assumes that the outcome of the jurisdiction coincides with the median of the most preferred outcome of the voting residents (Oates 1996 p213).

From the perspective of both the econometric modelling framework and the theory of collective choice voter modelling a strong case exists to adopt the median estimate of willingness (to pay, or accept) as the appropriate reflection of the generalised public will. Alternatively, in the



majority of CV surveys the mean is relied upon as the more precise reflection of the collective intention of the respondents. The reason for this is that the mean is the more definitive measure of central tendency within a population. It is as a consequence of the continuing mean *versus* median impasse that reference to both measures is provided throughout the analytical chapters of this thesis.

### 3.1.9 Constituency

The principles associated with the use of judicial juries have been in existence for centuries. They extend back to Norman times in Great Britain and, in various forms, as far back as the early Greeks. The theory in favour of the jury system suggests that it is a democratic institution, a good fact-finder, and that it dispenses justice rather than the law (Read 1986). Typically, jurors are given no special role in the judicial proceedings beyond reflecting on the issues presented to them to arrive at a verdict. In other words, their opinions are their own. They are not compelled to act as anything other than fair-minded individuals willing to consider the case on its merits.

In many ways the role of participants in the values jury process is a reflection of the judicial model. The views expressed by the VJ jurors are to be their own, and their charter is to consider the issues being addressed as fair-minded individuals representative of their community. On this basis, the jurors' constituency is defined as the bounded community they are entitled to represent. In some cases this 'community' may be difficult to identify in purely geographical terms, and may, instead, represent an alternative form of the community construct. It may be, for example, an epistemological community or some form of wholly temporal one. Throughout the trials the VJ members were asked to be mindful of their constituency in considering their responses. They were also reminded to be aware of the fact that it was the *aggregated* preferences of the jury that was the fundamental issue in the analytical review process, and so no individual answer would act to disproportionately skew the overall response set. This was to discourage the temptation to *free ride*, which held the potential for the introduction of strategic bias into the process. To this end, each of the jury members was asked to identify their *personal* WTP and WTA rather than attempt to estimate what their constituents would be willing to pay (or accept). Throughout the jury exercise there were several exceptions to this instruction. In some instances the jurors were also asked to identify what they considered was a fair assessment of their community's preferences. This was reflected in questions such as, 'how much would the people of [your community] expect as a satisfactory off-setting benefit for the loss of...?' In this they were asked to play the role of advocates or value consultants. In other instances they were asked to consider their response as if they had each been delegated by their community to

fully negotiate on behalf of its interests. Beyond this, the analogy with judicial juries diminishes further. Unlike traditional judicial proceedings, VJ jurors were encouraged to participate in dialogue with the moderator, guest speakers, and even amongst themselves, as an aid to arriving at their personal decisions. In many cases jurors may have been exposed to information about their community that they were not previously aware of, and so questioning of evidence became critical. This is a fundamental tool of the VJ process. Another important point of departure from the traditional jury model is that jurors were directed to consider their decisions from an alternative view. Specifically, in the VJ trials, jurors were asked to firstly consider their opinions on several topics from a personal point of view. They were then exposed to the Sagoff *consumer* versus *citizen* dichotomy, and asked to place themselves in the role of the latter for a review of their original responses. In this way they were encouraged to reflect not only on the issue and its temporal and spatial significance, but also on their way of thinking about it. Whether they altered their mode of thinking because of this instruction toward a more ethical/deontological perspective or not is evidenced in their responses to the iterated round of questions.

#### 3.1.10 Information

The capacity for large amounts of information to be delivered directly to participants is an advantage that the VJ model has over many other forms of public opinion survey. Material relevant to the topic being addressed can be presented in a variety of forms because all jurors are normally present in a common setting throughout the entire exercise. The face-to-face nature of the delivery process should encourage dialogue, clarification, and interaction between all of the participants in the exercise.

Throughout the VJ trials the moderator was the source of much of the information disseminated. The notable exception to this was the vital role of the expert witnesses who provided an extended presentation of their cases concerning the Macquarie Marshes. The two advocates used a variety of media to support their convictions including visual displays and oral presentations. Beyond this, they also accepted questions from the audience at specified times – controlled and monitored by the moderator – to ensure that the jurors were confident of the nature of the messages being delivered.

The moderator's initial role was to introduce and explain the VJ process, its objectives, novelty, and the role of the various parties. Once this part of the sequence was completed, the moderator's role altered to become that of the presenter of the topics for consideration. The most crucial function of the moderator was to present information without covertly leading

respondents to answer questions in a particular manner. The problems of 'interviewer bias' and 'compliance bias' (where people may be prone to shape their answers to appease the interviewer), are just as applicable to the VJ process as they are to any other form of preference elicitation process. Under the conditions created for the operation of the trials in this study the topics for consideration focused on 'local' issues which tended to limit the amount of background information required to be provided to the jurors.

Sections 1-5 of the questionnaire represented the introductory components of the jury exercise, and were delivered as an oral presentation by the moderator. The information attached to these sections was limited and organised in a manner that would avoid as much confusion as possible. Any points of order were addressed by the moderator and clarified with each of the inquirers before any further progress was made with the questionnaire.

Sections 6-10 addressed hypothetical issues relating to actual local features. Where considered appropriate, photographs of the particular feature (historic building, war monument) were presented on an overhead projection to the jury to ensure they were aware of the object in question. Very limited information pertaining to each structure was provided by the moderator to ensure that the possibility of emotive or leading statements was minimised. Generally, while the moderator held a variety of other information about the structures the information presented to each jury was confined to details of its age, location, general purpose and usage, and hypothetical threat to its existence. Beyond this, if any juror sought further amplification it had to be requested, and rather than be provided directly by the moderator, the question was also usually offered to the other jury members for their knowledge to be shared.

Sections 11 and 12 introduced some of the central issues relating the Macquarie Marshes. A prepared script was read to each jury by the moderator (refer to Section 11 of the questionnaire contained in Appendix 4). Several photographs of the Marshes, as well as healthy irrigated crops, were shown to the jurors as part of this introduction. Once again, the objective was to introduce the topic without implicitly leading the answers from the participants. Supplementary information – if available – was provided to the jurors upon request, and answers or opinions from within the jury membership were encouraged.

Sections 13 and 14 required participants to adopt the roles of community negotiator and *citizen*, respectively. The former involved a very limited amount of introduction and was generally accepted without much difficulty. The latter role was intended to be a novel application of Sagoff's definition of the citizen role. It was provided in the form of a wall poster in large print for continuing reference by the jurors. All of the issues for consideration in this section were

repeats of earlier topics and required no new or supplementary information to be delivered to the jurors.

The following sections were withheld from the juries until the extended debate about the Macquarie Marshes was completed. Over a period of several hours the two expert witnesses presented their case for water and irrigation management in the Macquarie Valley in terms of its impact on the Marshes. A vital role of the moderator was to encourage a strong element of controlled dialogue throughout this portion of the jury exercise. All questions to the two advocates were directed through the moderator to ensure that a fair hearing was given to as many jurors as possible. Sections 15 and 16 of the questionnaire were presented to each jury at the completion of the Marshes debate. These two sections simply repeated the questions that had previously been put to the juries in Sections 11 and 12 prior to the broadened debate being conducted.

Section 17 represented the reflective component of the questionnaire and was conducted with the provision of no supplementary information beyond each participant being requested to read the questions themselves. Once this was completed all questionnaires were collected.

Following the collection of the questionnaires, each of the jury settings became much less formal and a considerable amount of discussion on several of the day's topics proceeded involving all parties to the process. This was a relatively important part of the jury exercise as it obviously provided jurors with confirmation of the significance of the exercise and allowed the moderator to express opinions and perceptions of the proceedings that may have been unduly influential had they been raised earlier.

### **3.2 Discursive criteria**

A discernable theme evident in much of the public-issue literature is the recognition that considerable scope still remains for the evolution and adaptation of an expanded range of methods to enhance the meaningful participation of citizens in decision-making processes. It is a topic that has developed immensely following the various civil-rights campaigns of the 1960's, resulting, ultimately, in legislation enshrining the need for public consultation being passed in many Westernised nations. The problem is not only one of discovering alternative models of participation that attempt to satisfy these new demands, it is also one of evaluation: how well do new models perform?

Although many techniques for evaluating participatory models exist (see, for example, Wadsworth 1991), 'a systematic framework for evaluation on any but the most abstract level is completely absent' (Renn, Webler and Wiedemann 1995a p xiv). This is an aberration that should concern those who commission public participation exercises because it leaves open the question as to how adequately a novel method may match the purpose to which it is applied. If a meta-evaluative model was to be developed it would have to define and defend normative ends that public participation aims to achieve as its primary goal. As yet, no such widely accepted model exists although Webler's (1995) adaptation of Habermas's ideal speech pattern theory appears to go some way in providing a reliable framework.

Webler suggested that certain standard criteria should apply to any public discourse process to ensure that fairness and competence prevailed. Essentially, he argued that all acts of speech should be subject to claims of validity. Of course, many acts are relatively trivial and require only the most modest validation (for example, 'It is raining outside.'). Others may be much more subjective and make claims about truth, normative judgements, and may even involve assessments of sincerity (for example, 'The dingo is an endangered species, it should not be allowed to become extinct, and I will do my best to save it.'). It is these types of speech acts that go some way to explaining what people do in situations of discourse. Beyond this, it is the means by which people make – and validate – such claims that assists in identifying whether the discursive process was fair and competent. These two (fairness and competence) are generally the unstated twin goals of most credible public participation exercises. They are therefore also applicable to the values jury trials. For this reason the evaluative criteria to be applied to the assessment of the efficacy of the values jury model is drawn from Webler's discursive standard criteria schema (Appendix 1).

Renn *et al.* (1993) had earlier proffered the suggestion that for public participation to be truly transparent and reflect accountability, the process should be deconstructed into three distinct steps. Firstly, the specific concerns of the parties to a particular issue should be clearly identified. Parallel to this requirement is the need to adequately define the stakeholders with legitimate concerns about the topic. Secondly, a process of option assessment ought to be undertaken to refine the range of possibilities to be presented to the interested parties. Thirdly, these policy/decision options should then be presented to the stakeholders for them to raise their concerns in the presence of all of the other interested parties. It is from the implementation of these processes that Renn *et al.* suggest that outcomes can then be framed which satisfactorily represent the consensually agreed interests of the stakeholders. In most cases the outcomes are

likely to be policy recommendations and priority suggestions for consideration by the appropriate public authority.

Webler incorporates the essence of Renn *et al.*'s first two steps into his own discursive criteria suggesting that for fairness to be seen to be present in any public participation process rules about who should attend and how the process should be moderated ought to be agreed by all stakeholders (or at least, by their representatives). This is an honorable goal and one that deserves considerable recognition if the parties to the participation process are faced with choosing from a range of process models. Unfortunately, under the research conditions associated with this study it is the model of participation that is the focus of investigation. As a result, participant negotiation about the topics of concern, the vehicle for their consideration (the values jury), and the role of the moderator must, of necessity, be relegated to a lesser role for the benefit of the overall research process. In other words, the demands of the research must claim priority over the otherwise legitimate demands of democratic theory. To the extent that Webler's framework incorporates recommendations concerning participant input into the setting of agenda and process rules, as well as moderator and rule enforcement, these are, of necessity, excluded from the discursive criteria of the current VJ trials. Despite this set of pragmatic exclusions all other aspects of Webler's discursive criteria remain applicable to the values jury process.

As a means of assessing the extent to which the jury participants estimated that the VJ process was fair and competent Section 17 of the questionnaire was specifically framed to elicit the summative *ex-post* impressions of the jurors.

### 3.2.1 Discursive criteria assessment

By way of introduction to the assessment of the discursive efficacy of the values jury trials, the jurors were asked (questions 103-106) to confirm whether their willingness to attend the trial was subject to the magnitude of the cash payment they each received for their participation. Due to the novel character of the VJ exercises there was no obvious precedent for determining the quantum of attendance remuneration necessary to enable viable juries to be formed. On this basis, the \$80 honorarium may have represented an overly generous amount. To confirm this, the questions were framed to reveal the amount that would have been just adequate to form a viable jury. The Jurors were also encouraged to provide comments on their overall reflections about the jury process.

Each of the remaining questions in the instrument (questions 107-121) was aimed at eliciting the participant's impressions of the operation of the jury model. Webler's framework provides for assessment of *fairness* to be differentiated from that of *competence*. Fairness, he suggests, is evident in the way that people feel they have been provided with adequate opportunity to express and protect their personal interests, and to contribute to the collective will. This is then applied by Webler in three main categories: agenda and rule making, moderation and rule enforcement, and discussion. As noted above, the first two of these are necessarily absent in a study such as this one simply because of the exploratory nature of the research. As a result, the fairness criterion is applicable only to the participants' assessment of the discussion process within the jury settings. Several of the questions (107, 108, 116 and 117) were framed to reveal the jurors' impressions of the fairness of the values jury approach.

The remaining questions were premised on disclosing the participants' impressions of the competence of the jury process. Webler defines competence as reflecting the ability of the process to provide participants with the procedural tools and knowledge needed to arrive at the most informed decision. He goes further to suggest that it is intimately associated with access to knowledge and interpretations, as well as involving implementation of the best possible procedures for dispute resolution. Within this framework, he recommends that rules should be provided to ensure that in any dialogue the speaker's validity claims are verifiable. Those claims may be associated with the language and comprehensibility of the speaker (questions 109, 110 and 111), knowledge about the facts subtending the speaker's statements (questions 112, 113 and 115), emotive and normative statements made by the speaker (question 114), and objective veracity of the speaker's statements (questions 118, 119 and 120). With the exception of normative validity, questions about each of the other claims were presented in an iterative format to identify the reliability of the claims. Claims about normative validity were considered to be most appropriately clarified with a single straightforward question. The final question (121) was included to identify if, as a result of the jury process, the participants had increased their awareness of the primary topic (the Macquarie Marshes issue) to the extent that they had actually changed their opinions about its significance. This question was intended to verify the results of the statistical analysis of the 'before-and-after' value assessments undertaken earlier in the jury trial exercise.

Each of the fairness and competence questions was presented in a form which required the jurors to express their impressions on a interval-based Likert-type scale (0-5). This corresponded with a constrained range of responses spanning from 'no' (0) through to 'yes' (5). This was intended to reflect the breadth of possible views ranging from extremely negative, up to a strong agreement that the specific aspect in question had been successfully incorporated as a

means of providing for adequate public input. To supplement the views expressed by the scalar measurement responses, each question was also provided with a space for participant commentary. Similar to each of the earlier comment-based questions in the instrument, the responses were graded 0-4 to reflect the strength of normative commitment evident in their answers (refer to Section 4.1.3 for details on the scale used).

To reinforce in the minds of the Macquarie Marshes expert advocates that their role in the jury process was being observed and monitored (via Section 17 of the instrument), both of them were provided with a copy of the questions contained in that section of the questionnaire prior to preparing their presentations. On this basis, each was clearly informed that their principal objective was to deliver an informed view of the topic within the guidelines of fair and competent discourse.

### **3.3 Economic and statistical analysis**

Economics is fundamentally concerned with how people make choices. Goods are sometimes scarce, and at other times they are abundant. Many of these goods are well represented in the market and the price paid for them is free of contention. Many more though, are not so easily valued by the operation of the market. It is under these conditions that techniques such as contingent valuation are relied upon to register a price where, otherwise, no price would be evident. These models of value determination are not without their detractors. To overcome the perceived deficiencies and supplement these methods, other non-economic models have begun to emerge which take a much more deliberative approach. Together, the deliberative and economic models are breaking new ground (Holland 1999 p285). The way forward may involve the removal of more of the institutional and epistemological constraints that segregate the use of these disparate approaches. As a hybrid technique the values jury is a model that finds a niche in this movement.

Although the central focus of this study is to evaluate the efficacy of the VJ deliberative process, it is also necessary for the economic data revealed as part of the process to be analysed for its relevance and consistency. For this reason the questionnaire was framed to capture as much economic information as possible using a contingent valuation stated-preference approach.

#### **3.3.1 Economic analysis**

The fact that the market is sometimes a poor reflector of people's sentiment toward a good – particularly a public good – suggests that axiological premiums exist that need to be identified if



the more precise measure of monetary estimates of total value are to be incorporated into a cost-benefit analysis. Willingness-to-pay and willingness-to-accept estimates concerning assets that have a public good element are in fact revelations of reservation prices at which level people would feel indifferent between paying (or accepting) the price and foregoing the good. There appears to be nothing (economically) irrational about people identifying their reservation price for public non-traded goods except for the fact that it may be several orders of magnitude greater than the expected market price. In daily commerce, reservation prices are negotiated between buyers and sellers and transactions tend to proceed on the basis that a benefit accrues to both parties from the exchange: this is recognised in the theory of consumer- and producer surplus. The agreed price is usually considered to be within a rational trading locus and close to the intersection of the marginal cost and marginal benefit that represents the price point of equilibrium to which the broader market is subject. In all of this process, it is generally assumed that each party is also acting with at least some self interest, although altruistic and benevolent motivations can not always be dismissed.

One problem that arises, particularly where public goods are concerned, is that while the market may satisfactorily identify the *positive* value of a good, people often hold deeper *normative* values that are outside of the domain of the market mechanism in terms of their measurement. Public goods also raise an additional dilemma for policy makers in that they are sometimes so abundant that they are prone to overuse. Pollution of air and waterways is a prime example. Conversely, they may be so expensive to provide they can only be afforded by government expenditure. Maintenance of a standing defence force is the most obvious example of this. Under these conditions, questions about how much of any such good should be provided usually become very difficult to answer. They become even more problematic when extended temporal and spatial scales are overlaid on them. It is under these circumstances that deliberative and hybrid models are beginning to supplement the findings of purely economic-based assessments.

Throughout the values jury trials the participants were asked a series of open-ended questions concerning their WTP and WTA associated with a range of goods with at least an element of 'publicness'. Each of the assets was under hypothetical threat of destruction or diminution. These economic measurements of value have been used extensively in CV studies as a means of identifying the points of indifference between the loss of one good in exchange for another. In the case of this study, questions about each feature were generally framed so as to reveal the jurors' indifference price to the loss of the feature being addressed. In each case the question was repeated on the basis that the feature was *not* unique and that the demise of the feature would simply mean that one less existed, while others still remained in the vicinity. Based on an iterative process it is possible to map the indifference curves and determine at which level of

initial provision the marginal rate of substitution (also known as marginal value under these circumstances) falls to zero. On this basis it is people's WTP and WTA for public goods that represents their estimate of value in excess of market value (axiological value). At zero, market price prevails.

In a typical equilibrium model WTP bids are stacked vertically for each individual so that a total WTP for the concerned community is generated. Because most CV-type studies use sampling rather than broadscale census techniques, the total WTP is inferred from the measures provided by the representative sample. The equilibrium point – the one at which Pareto optimality theoretically occurs – is marked by the intersection of the WTP aggregated bids and the marginal cost line for the particular good. A significant point about axiological values in common with many types of public goods is that they tend to lack any sort of marginal supply price. In the absence of this, there is no apparent point of intersection and so inevitably the price is implied as zero. This may also be reflective of a more fundamental problem, namely, the confusion of WTP with WTA. Most CV studies rely heavily on the good in question being valued by recourse to the amount inferred from people's willingness-to-pay to avoid the loss of the asset. In many cases the alternative construction may be more appropriate and ultimately favour conservation of the feature over its demise. That is, it may be people's willingness-to-accept that should often be invoked as a measure of value on the basis that – because it is a public good being addressed – they already hold the joint rights to the good, and as such, it is their reservation *sale* price that is relevant, not their reservation *purchase* price. This category error appears to be common in many CV studies. It is also one that has an attendant follow-on problem, namely, differentiation of individual WTA from joint WTA. Ward and Duffield's (1992) waterfall example typifies the issue. They found that people were willing to accept an individual payment of \$22.00 as compensation for the loss of the public good. While this was several orders of magnitude greater than the WTP average bid (\$3.50), it seems doubtful that such a payment would appropriately compensate individuals for this type of public loss. The confusion appears to lie in the researcher's confounding of the joint WTA with that of the individual WTA. They simply divided the total aggregated loss to the impacted community by the number of people in the community to arrive at the \$22.00. The *collective good* nature of the waterfall suggests that it is not the loss to the individual that should be measured but rather, the undivided loss to the community. On this basis the \$22.00 expression of loss becomes irrelevant. In the present values jury study questions of both joint and individual WTA have been incorporated into the questionnaire to establish which of the two expressions are more valid from an economic perspective. On the basis of the curves produced by people's expressions of (both types of) WTA it is then a matter of a purchaser's WTP intersecting with

the relevant curve that can then establish the likely negotiated value of the public good in question.

One other novel aspect of investigating people's WTP and joint WTA is that it has the potential to reveal an implied social discount rate for the particular public good. In this case the WTP question must be expressed as a willingness to pay *in perpetuity* as a form of permanent taxation impost or similar. By using the joint WTA as an expression of the net present value (NPV) of the asset, and the aggregated individual WTP (across the impacted community) as a form of annualised payment, the discount factor can be revealed.

$$NPV = \frac{\sum_{t=1}^n \frac{PMT}{(1+i)^t}}$$

or

$$i = \left( \sqrt[n]{\frac{\sum_{t=1}^n \frac{PMT}{NPV}}{1}} \right) - 1$$

Where  $i$  is the social discount rate,  $PMT$  (payment) is the annual aggregated payment,  $NPV$  is the net present value, and  $n$  is the period in years (usually a figure of 100 is adequate).

One consistent oversight of many CV studies is their inattention to the capacity for respondents to actually meet WTP bids. Despite the normative nature of many expressions of value, if WTP exceeds the budget constraints of the individual respondent then the valuation derived from such unconstrained bidding may be meaningless. Conversely, it may represent a very firm indication of people's strength of unconstrained vote. It was considered an obligation of this study to ensure that any potential WTP bids were set in the context of the respondents' actual capacity to bid. This problem of identifying the individual's budget constraint is associated with concerns about instrumental bias. Problems with scope and embedding bias are widely recognised in the CV literature and yet little research has been done to place these issues in perspective. For example, if participants in a CV survey offer seemingly exaggerated bids and the researcher does not know what the respondent's actual orientation is toward that particular issue, then how can the bid be assumed to be excessive? It may be that the specific individual always makes large donations to the particular public cause. Conversely, the person may simply be *free riding*. An alternative explanation concerns the issue of scope bias. If respondents appear to confuse the single issue being addressed with a range of much broader ones when offering their

bid, then it may be possible that they are actually offering a bid that represents an insurance payment. Their WTP offer then alters to represent a payment possibly quite within the individual budget constraint but it is for *all* similar public threats, not simply the one in question. Many alternative constructions are probably possible but without placing the bid price within the context of the person's historical record of actually making such payments, CV researchers run the risk of only ever conjecturing about the potential bias in such bids. This study ensures that WTP bids are firmly located in the context of the individual's capacity to bid.

Tversky and Kahneman's (1981) suggestion that people hold an asymmetric value function is as relevant to public goods as is it to private ones. By way of reference to local hospital equipment, this study provides a measure of its existence. For policy planners the asymmetry may be important in that the loss of a public good may be considered much more contentious than the addition of an extra unit of the same good. In terms of placating a distressed local community, decision-makers may need to be aware that such asymmetry can exist.

### 3.3.2 Statistical analysis

A fundamental task of this thesis is to determine to what extent associations exist between a range of the variables under investigation. Finding elements of interactivity may enhance the validity and reliability of the values jury process and cast some light on any predictive capacity evident in the associations. From this initial assessment, the data may be then interrogated further to establish the significance of any of the associations.

The primary objective of this VJ study is assessment of the efficacy of the jury model. To satisfy this, the first phase of the statistical analysis focuses on the extent to which the sample of participants in the trials reflected the socio-demographic characteristics of their constituent community (as indicated by the responses captured in Section 1 of the instrument). Much of the data collected in this part of the instrument was dichotomous and in a nominal variable form (e.g. 'male/female'). The exception to this was data relating to the participant's age and the orientation of their environmental sympathies. The degree of environmental sympathy was captured on a Likert-type scale (0-5), and represented the only category in this opening section of the questionnaire that was not amenable to comparison with secondary, population-based data.

A fundamental issue for a fair assessment of the efficacy of the jury trials concerned the degree to which each of the juries reflects the public it was intended to represent. One of the advantages of the jury process is that it relies on a relatively small, manageable sample. The

sample is not intended to be self-selected and so a critical element of the selection process involves the identification of a representative group from within the impacted community. To establish if the people attending the VJ trials adequately reflected a range of selected socio-demographic characteristics, a z-test of proportions was applied to each of the juries. The general form of the hypotheses are:

$H_0$ : There is no significant difference between the proportion of the characteristic in the sample and the population from which it is drawn.

$H_1$ : A difference exists.

The test is conducted on a two-tailed basis, with a 95% confidence level applicable. The population data are drawn from census-based secondary sources such as the regular figures released by the Australian Bureau of Statistics.

Where appropriate throughout the analysis, data were transformed into a form that would encourage a more sophisticated level of analysis. In the introductory section, for example, where dichotomous variables were captured, they were transformed into ordinal categories. On this basis, gender options ('male or female') were converted into dummy variables '1 or 2'. Similarly, employment status was converted into 1 = 'employed', 2 = 'not currently in the workforce'. This type of transformation then enabled a higher level of statistical interrogation.

Other transformations were also conducted. One of the assessments that the juries were asked to undertake was of the value of a historic building situated within the municipal boundaries of the four trial locations. Each jury was therefore assessing a different building. To standardise the analysis, the juries' mean and median assessments of value were converted into percentages of the specific building's market value. Under these conditions, it is not the raw value that is being compared, instead, it is the percentage premium above market value that is the subject of the analysis. On this basis, meaningful comparison of the four juries' estimates of value are made possible, despite it involving four separate examples of historic buildings.

Investigation of potential correlations amongst variables was the first step in the data review process. Where data were in a raw interval-based form requiring no transformation, the test for correlation is Pearson's  $r$ . The data that was subjected to transformation into an ordinal-based form was consequently made suitable for correlation using Kendall's  $\tau_b$ . In the introductory section, any such correlations could provide an indication as to who was most likely to accept an invitation to attend a jury exercise. It could also provide a hint as to who may be most likely to

attend a similar exercise in the future, and what personal characteristics they may have. In each of the subsequent sections of the instrument, correlations between the data and these socio-demographic characteristics of the jury participants were also made identifiable.

Where correlation analysis was undertaken, significant associations were identified at a 95% confidence level (therefore  $\alpha = 0.05$ ), on a two-tailed basis. This was due to the relatively small 'sample' (jury) size in each location, averaging only 25 people. Analysing data generated by such a sample size at a higher confidence level than this may lead to inappropriate conclusions about the meaning of the outcomes. It may also lead to important trends in the data being overlooked.

The general form of the correlation hypotheses are:

$H_0$ : There is no significant correlation between the subject variables.

$H_1$ : A significant association exists.

Throughout this report, several hundred potential correlations are investigated. For the sake of convenience, these hypotheses are not identified individually. Instead, the generalised form is assumed to apply as the underlying basis for investigation of the subject associations. In addition, evidence to validate one or the other of the alternate hypotheses is presented without the formality of indicating that either of the alternative hypotheses is the one to be accepted. Instead, for the sake of efficiency in presentation, associations revealed by either one or other of the underlying hypotheses are simply identified and discussed as a matter of course in this report.

In many of the cases where significant correlations were found to exist, a regression analysis was also conducted. Whereas a correlation analysis provides an indication of the degree of association between variables, regression provides an opportunity to predict the impact of one or more variables, on another. Regression can be conducted using a bivariate or multivariate (multiple regression) approach as long as the data are in an ordinal or interval form. For this reason several of the regression equations generated in this report incorporate variables that have been subjected to transformation from their original nominal form. As a result, variables such as gender, residential status, and highest level of post-school education become predictors of dependent outcomes. The coefficient of determination ( $r^2$ ) is reported in association with the regression equation to indicate the predictive capacity of the equation.

Much of the detail presented in the results chapter of this thesis is based on the central tendency of the jury assessments. Where relevant, indications of both *mean* and *median* are provided. There are continuing debates in the literature concerning the appropriateness of relying solely on the mean indication of people's willingness to pay (or accept). It is generally argued that responses to such questions are often unduly influenced by outlier bids that make proper assessment problematic. For this reason, medians are also often reported in the literature. But the median is not without its limitations. The problem associated with its use is that if the outlier bids *are* a true reflection of people's actual willingness, then the median is not a sound indication of the general will of the sample. For these reasons, in this report both the mean *and* median aggregated jury responses are identified and analysed as necessary.

Several important debates continue in the contingent valuation literature concerning the application of various common statistical techniques to WTP response price bids. In the first instance, most CV studies appear to accept the NOAA (1993) recommendations that relatively large sample sizes are required for validation purposes. On the surface, this should result in bid prices falling within a range that may generally reflect a normal statistical distribution. The fact that this does not occur is evidenced by the often-wide differential between median and mean bid figures. The reason for this is that in almost all reported CV studies at least a portion of respondents are suspected of acting strategically by offering figures that are best described as implausible. They are invariably extremely large bids, rather than small ones. This tends to result in mean prices that are usually much higher than medians, regularly, by a substantial factor.. The effect of these outliers is to make statistical analysis based solely on comparison of means questionable. Despite this, most CV studies remain committed to using the mean as the preferred basis for analysis. A portion of the studies do attempt to compensate for the sensitivity with which the mean is impacted by these outliers by using *robust statistical estimators*, the most usual one being the  $\alpha$ -trimmed mean. In fact, the  $\alpha$ -trimmed mean with  $\alpha$  equal to 0.5 is the median, and the  $\alpha$ -trimmed mean with  $\alpha$  equal to 0 is the actual mean. Trimming is usually undertaken using an  $\alpha$  of 0.05 to 0.25 (Mitchell and Carson 1989 p227), with 0.10 being the most common single figure adopted (Haneman 1996). Effectively,  $\alpha$ -trimming dispenses with the same percentage of the extreme responses at both ends of the distribution range. The residual responses can then be incorporated into a more detailed statistical analysis involving, most often, t-tests of the difference in means. Apart from the fact that the choice of  $\alpha$  is quite arbitrary and therefore prone to manipulation,  $\alpha$ -trimming will only function effectively on samples where the residual observations are in adequate number to meet the assumption that they fall within a normal distribution range, so that parametric analysis can proceed. In most statistical analyses, the minimum number of observations to satisfy this requirement is generally

considered to be in the range of 20-25. Unfortunately, in the case of the values jury exercises, the *total* number of observations is around these same levels and as a consequence  $\alpha$ -trimming is unlikely to enhance results beyond making the observations more suitable for non-parametric analysis. Heath (1995) argues that even if the sample (in its raw form, or even subsequent to  $\alpha$ -trimming) does not necessarily meet the assumptions required for typical parametric analysis such as t-tests, it may be appropriate to use the parametric test anyway. His point is that the results of many t-tests have been shown to be valid despite large departures from the parametric assumptions. The alternative is to apply a non-parametric test of the difference in medians. Unfortunately, these tests tend to be less powerful than their mean-based equivalents. Although the medians are representative of the strength of intensity of the *median voter*, these types of tests are used sparingly throughout the data analysis of this thesis. The use of  $\alpha$ -trimming is avoided in the VJ trials' data analysis due to its inherent arbitrariness and the fact that, where appropriate, tests of means are conducted in association with those of the corresponding median.

Commonly throughout the thesis, the juries' mean indication of values (and several other quantitative assessments) are presented on a locational basis. That is, the mean response of each of the four juries is reported. As a basis for comparison of the means for each location, a one-way analysis of variance (ANOVA) is used to determine if there are any significant differences between locations. Confidence levels of 95% ( $\alpha = 0.05$ ), on a two-tailed basis, are employed throughout the tests. Once again, the hypotheses upon which the tests are based are excluded from the body of the results section for reasons of practical efficiency, but they generally comply to the usual form:

$H_0$ : There is no significant difference between the means.

$H_1$ : A difference is evident

Where, instead, the investigation is of a repeat measure of the same variable at two different points in the jury deliberation, a paired-samples t-test is employed to determine if a significant difference in the two sets of responses is evident. The hypotheses take the same form as the one indicated above.

Where median-based jury responses are the subject of review, the median test of  $K$  populations is employed. The test is used to determine if there is any significant difference in the median scores of two or more population samples. In the case of the VJ trials, a jury sample was drawn from four populations. Based on a two-tailed, 95% confidence level test, the general form of the



hypotheses are the same as for the mean-related ones noted above, with the replacement of 'mean' with 'median'. In the instances where the effect of an introduced variable on the median response of the juries is to be investigated, the Wilcoxon signed ranks test is employed. This was the case when, for example, the jurors were asked to indicate the quantum of their value-orientation towards the Macquarie Marshes issue. They were required to indicate their assessment prior to the discussion, and then again immediately following the delivery of a debate by two informed speakers. The Wilcoxon test indicated if there was any significant difference in the median responses as a result of the impact of the debate.

Where a trend in either of the central tendencies became evident, it was initially investigated using cross-tabulations. The more insightful and relevant ones are presented throughout the results section of the thesis. For reasons of expediency in space allocation, detailed analysis of other descriptives such as range, skewness, kurtosis, variance, standard deviation, and interquartile range are minimised unless they were found to be informative to the research process.

## 4 RESULTS

### 4.1 Juror representativeness

The values jury model is based on the analogy of a judicial trial rather than on a public opinion survey. For this reason it seeks to reveal the preferences of a small, well-informed, representative group of citizens from the impacted community, rather than those of a larger, less-informed group. This is the same theoretical framework that drives the judicial jury system. In a typical public survey the sample is expected to be drawn randomly, and of a scale sufficient to avoid criticisms of potential sampling bias. The premise behind this is that a larger sample is more likely to reflect the cross-sectional characteristics of the population from which it is drawn. In only the broadest sense could a sample of 25 people be considered to reflect the diverse characteristics of an entire community, and so the VJ model relies on an alternative construction.

The most obvious question to be addressed is how to ensure that the jury is formed of people who fairly reflect a range of selected characteristics that are evident within the subject community. To ensure that the group is perceived by decision-makers as representative, the selection process is not randomised. Jurors in the current trials were selected from a pool of respondents who indicated their willingness to participate. A form of *voir dire* was then applied to ensure that the six selected socio-demographic characteristics upon which the jury representativeness was based, were, to the maximum extent possible, adequately reflected in the final group of panelists. The characteristics were: gender, age, place of birth (Australia or overseas), residential status (own/buying, or renting), employment status (employed part-time or full-time, or not presently in the workforce), and highest level of post-school qualification (nil or basic, or technical qualification and above).

To test how well each of the juries reflected the background socio-demographic characteristics of the population (community) from which they were drawn, a z-test of proportions was applied (Table 11).

Location	Total attendance	Median age (years)	Gender		Country of birth		Residential status		Employment status		Highest level of post-school qualification	
			M	F	Aust	O/S	Own / buy	Rent	Empl	Not curr. empl	Nil +	Tech +
Warren	24	57*	9	15	21	3	14	10	8*	16*	18	6
Dubbo	26	43	12	14	25	1	20	6	15	11	17	9
Mudgee	25	41	10	15	22	3	19	6	14	11	11*	14*
Strathfield	25	51	14	11	18*	7*	18	7	12	13	9*	16*
<b>Total</b>	100	48	45	55	86	14	71	29	49	51	55	45

**Table 11. Selected socio-demographic characteristics of jurors.**

(Analysis includes comparison of these characteristics with their respective population parameters.

\* significant difference,  $\alpha = 0.05$ , two-tailed, all other figures show no significant difference).

Source of comparative figures: Australian Bureau of Statistics (1997), Australian Bureau of Statistics (1998a), and Australian Bureau of Statistics (1998b).

Overall, the characteristics of the jurors did not greatly vary from those of the community they represented. Despite this general finding, several exceptions were evident. The median age of the Warren attendees (57 years) was considerably older than that of the municipality (42 years). Many of these were retirees and so this also had an impact on the employment characteristics of the group. Warren's employment rate was 59.7% (of all people aged 18 years and over). In the jury group, this figure was only 33.3%.

The Dubbo group showed no significant variation to that of the broader community with regard to any of the characteristics.

The Mudgee group displayed a higher proportion of post-school qualifications than was evident in the Local Government Area. This suggests that the jury exercise may have represented a novel attraction to some of the more qualified people in the district. This is re-iterated by the relatively high level of employed people who forwent their regular day's work activities to attend the VJ function: 14 of the 25 jurors were employed.

The Strathfield jury departed in its characteristics in two of the criteria. Firstly, the area has a large proportion of its population who were born overseas (47.8%), but the group was dominated by Australian-born participants (72%). This may be a reflection on the initial sampling technique, in that systematic stratified sampling using the telephone directory as the database may have inadvertently excluded some ethnic groups who prefer to avoid publishing

their telephone numbers and associated details. Secondly, similar to the Mudgee group, the proportion of higher qualified people in the Strathfield jury was well above its Local Government area rate. The rate was 64% in the jurors compared to the area figure of 31.8%. Once again, the nature of the exercise may have proven intellectually appealing to those with higher qualifications simply due to its novelty.

	Location	Gender	Birth place	Residence status	Employ- ment status	Qualifi- cations	Age
Location							
Gender	-.100						
Birthplace	.163	.075					
Residence status	.087	.091	-.067				
Employment status	-.082	.038	.223*	-.035			
Qualifications	-.387*	-.059	-.132	.085	.118		
Age	-.167*	-.120	.169*	-.045	.108	.175*	

**Table 12.** *Correlation matrix for associations between selected socio-demographic characteristics of the jurors. (\* significant correlation ,  $\alpha = 0.05$ , two-tailed)*

Bivariate correlation coefficients (Table 12) confirmed a number of significant associations within the juror’s socio-demographic characteristics. The strongest correlational link existed between juror’s education levels and their location. Strathfield exhibited the highest overall levels of qualifications (16 – representing 64% - held technical certificates or higher), followed by Mudgee (56%) and Dubbo (35%). In the Warren group only two (8%) of the participants held any qualification at the technical level or higher. Given that there was also a significant association between age and location, and age and qualification, it appears that older participants are likely to demonstrate a lower incidence of post-school training, particularly in rural areas. Birthplace also had a significant level of association with both employment status and age. It was evident that jurors born overseas demonstrated a lower level of workplace participation, but this is probably best explained by the generally older profile of participants who were born outside of the country. The median age of Australian-born jurors was 47, while for the foreign-born members it was 56. The younger age profile also explains why Australian-born participants had an overall higher employment status.

A final question in the introductory section of the instrument concerned juror's environmental orientation. Several national surveys have found a strong environmental sympathy entering the Australian social psyche in recent years (Reeve and Black 1993, Australian Bureau of Statistics 1994, Vanclay and Lawrence 1995, Australian Bureau of Statistics 1996). To test for its presence in the jury members question 7 required participants to identify their orientation on a bounded interval scale (0-5), with '0' representing a very anthropocentric, pro-development, view, and '5' a strongly pro-environment, conservation orientation. Neutrality was identified at a rating of 2.5. Overall, the jurors indicated they held a modest pro-environmental orientation, with a mean score of 3.265. A one-way analysis of variance ( $\alpha = 0.05$ ) confirmed there was no significant difference in the strength of orientation between the four jury groups. In addition, a (Kendall's tau<sub>b</sub>) multiple correlation analysis was undertaken to determine if any significant associations existed between juror's environmental orientation and their socio-economic characteristics. Only one of the characteristics was found to be significant, namely, location. Jurors representing Mudgee and Strathfield indicated a modestly stronger attachment to the environment than Warren and Dubbo participants. This was despite the fact that overall, the mean scores for environmental sympathies varied only marginally between the locations.

#### 4.1.1 Willingness to attend

The following details refer to questions 103-106 of the instrument. Of the total 100 attendees at the four jury trials only 42 indicated that they would have participated even if they had not been paid an honorarium (Table 13). The largest single group confirming their willingness to participate without payment was in Warren where 17 of the 24 participants indicated that they had needed no financial incentives to encourage them to attend. The 17 represented 71% of the Warren attendees, possibly confirming the high participation rate of retirees, who may not have been engaged in alternative activities. In each of the others, the number of people indicating they would have co-operated regardless of the payment, ranged from 27% in Dubbo to 36% in both Mudgee and Strathfield. On this basis, it is doubtful that the trials would have proceeded without the provision of a financial incentive to attend.

Table 13 shows the level of incentive payments nominated by those participants who otherwise would not have attended the VJ exercises.

<b>Location</b>	<b>Mean attendance payment required by those who otherwise would not have attended (\$)</b>	<b>95% confidence level for attendance payment (\$)</b>
Warren	15.83	4.09-27.57
Dubbo	42.88	30.53-55.24
Mudgee	42.20	27.84-56.56
Strathfield	40.60	26.85-54.35
<b>Total</b>	<b>35.65</b>	<b>29.06-42.24</b>

**Table 13.** *Mean attendance payments required to encourage participation in the jury process.*

With the exception of the relatively modest amounts nominated at Warren exercise, there is an obvious consistency in the responses of the participants to the question as to what payment they would require to attend the full-day jury. Although the mean figures of around \$42 are enlightening, it is the upper bound of the 95% confidence range that is more important. This is the amount that virtually all attendees would have accepted as adequate compensation for their time if they had not received the \$80 payment actually provided to them. On this basis, it is evident that a payment of around \$55 would have been adequate to secure the services of a majority of the participants, but not necessarily *all* of the participating jurors. To have achieved jury attendance rates similar to those actually reached would have required a much larger sampling range if the incentive had been reduced to \$55. Clearly, because one of the central objectives was a complete jury with 23-26 members, the \$80 payment was necessary.

If the jury exercise had been extended to cover two consecutive days (with a further \$80 payment) 80% of the attendees indicated an ability to participate. The lowest response to this question was in Strathfield (60%), with the highest being Dubbo (92%). Mudgee and Warren both achieved results of around 84%. This level of affirmation is somewhat surprising given the large proportion of people who would have to forgo another day of their regular employment for them to be able to attend. It may suggest that the jurors found the exercise informative and a valuable learning experience.

As a means of offering feedback to the research process, question 106 asked for comments from the jury participants. This was also intended to validate the responses to the previous questions concerning their opinions about payments and attendance. Unfortunately, despite moderator encouragement, only 47 jurors provided any commentary. Of these, 22 made only brief remarks such as 'enjoyed the day's activities'. The remaining 25 offered extended comments ranging up

to quite passionate analysis of the jury process. Correlation analysis (using Kendall's Tau<sub>b</sub>) indicates very limited association existed between the strength of people's comments and their responses to the earlier questions about payment for attendance (coefficients of -.198 and .151 for correlations between question 106 and 103, and 104, respectively). Overall, the commentary received was positive and encouraging to the process. Very few remarks were made that suggested, or even inferred, that the jury exercise was lacking in any fundamental way. This was taken as a sound affirmation of the model as applied in the four locations.

## **4.2 Discourse assessment**

Participant assessment of the values jury process on the *fairness* and *competency* criteria occurred on an *ex-post* summative basis. The questions asking jurors to rate the experience of the exercise on these criteria were iterative and generally followed Webler's framework. The rating scale used for each of the questions was bounded to a 0-5 interval range. This effectively allowed the jurors to rate aspects of the process ranging from totally negative, absent or inadequate (0), up to very affirmative, and beneficial (5). The rating scale used also enabled a transformation of the results into a percentage scale for enhanced comprehensibility. The bounded rating scale ensured that extreme outlier responses were avoided and so comparison of the mean results for each location was made possible.

To confirm whether there was consistency of responses across the four jury locations a one-way analysis of variance was applied to the untransformed data.

### *Fairness criteria* (questions 107,108,116 and 117)

The participants' overall assessment of each of the jury exercises was extremely positive (Table 14). They indicated that there was adequate opportunity to ask questions, seek clarification of the terms used by the speakers, and effectively participate in the dialogue process. The analysis of variance confirmed that a lesser degree of satisfaction was experienced by the Strathfield jurors regarding questions 107 and 116. These two questions referred to the VJ technique's capacity to provide for interrogation of the speakers, and whether the process was generally conducive to encouraging dialogue. Despite the difference evident in the mean responses of this group compared to the others, Strathfield's overall rating on each of these questions was still relatively high. One potential reason for the discrepancy in the Strathfield results may have been the presence of a small number of jurors who, despite the moderator's

Question	Location					ANOVA
	Warren	Dubbo	Mudgee	Strathfield	Total	
<i>Q. 107 Was there adequate opportunity to ask questions and criticise claims?</i>	95	90	92	71	87	*
<i>Q. 108 Are you confident you understood all of the terms and expressions used by the speakers?</i>	89	92	89	85	89	ns
<i>Q. 116 Do you think that the VJ model provides for an adequate level of dialogue?</i>	85	88	91	73	85	*
<i>Q. 117 Is the VJ model a fair and satisfactory means of revealing the community will?</i>	87	84	86	78	83	ns

**Table 14.** Mean scores for fairness assessment criteria.

(Note: scores are transformed from their raw state into percentages in the table.) (ns = no significant difference between locations. \* significant difference,  $\alpha = 0.05$ , two-tailed.)

attempts, tended to make their opinions known on a regular basis throughout the exercise, disproportionate to the input of other jury members. None of the other juries indicated any similar perceptions.

For each of the questions relating to fairness the scalar format was accompanied with provisions for juror comments. Despite moderator encouragement and allocation of adequate time within the day’s pre-established limits, very few of the jurors chose to supplement their rating assessments with supporting comments. Where participants did offer remarks they tended to be brief and reflective of their views of the topic rather than of the process. So, comments such as ‘I support the arguments about saving the Marshes’ throughout Section 17 of the questionnaire, unfortunately provided negligible supplementary support to the participant’s quantitative assessments of the jury process.

*Competence criteria* (Questions 109-115, and 118-120)

Table 15 shows the results of the competency assessments. Across the locations there is no significant difference evident in the ratings of each of the categories by the juries. This suggests that not only were the jurors remarkably consistent in their assessment, the re-presentation of the



jury process, along with the topics, and speakers, was also conducted in a consistent manner across the four locations.

The overall competency assessment of the VJ process was also extremely positive. Transformed scores for all categories were high, indicating that the participants were satisfied that, as a model of public participation, the VJ exercise was competent in dealing with the type of issues presented for consideration in these trials. Importantly, consistent ratings were scored across all four categories of competency: language and comprehensibility of the speakers (questions 109, 110 and 111), knowledge about facts supporting the speaker's statements (112, 113 and 115), differentiation of positive and normative statements by the speakers (114), and objective veracity of the speaker's statements (118, 119 and 120).

Notably, the sincerity of the speakers was rated very highly (Q 118). It was evident that both of the expert witnesses who delivered presentations concerning the Macquarie Marshes acted professionally and made concerted efforts to limit their claims to issues of fact rather than emotions.

Consistent with the participant commentary associated with the *fairness* criteria, very few offered substantial feedback on any of the *competency* assessment issues. Once again, those remarks that were committed to paper tended to focus on the topic rather than on the process. As a side issue, many of the jurors replaced any commentary about the process with a few words of appreciation in the final instrument question. The general nature of these statements suggested that although they found the jury exercise mentally taxing, they had enjoyed the intellectual stimulation it had provided.

Question	Location					ANOVA
	Warren	Dubbo	Mudgee	Strathfield	Total	
<i>Q. 109 Did the speakers give adequate definitions of their terminology from the start?</i>	80	86	93	82	86	ns
<i>Q. 110 Did the speakers aim their presentations to suit the mixed audience?</i>	90	85	88	83	87	ns
<i>Q.111 Did the speakers clearly try to resolve issues of definitions and terms?</i>	85	90	87	82	86	ns
<i>Q. 112 Did the speakers provide adequate evidence to support their claims?</i>	82	80	87	80	82	ns
<i>Q. 113 Would other experts have found the speakers credible?</i>	82	81	82	88	84	ns
<i>Q. 114 Did the speakers clearly differentiate normative and positive claims?</i>	90	83	84	84	85	ns
<i>Q. 115 Is the VJ process a reliable means of understanding a contentious issue?</i>	85	83	84	75	82	ns
<i>Q. 118 Did the speakers demonstrate a sincerity in their commitment?</i>	97	95	96	95	96	ns
<i>Q. 119 Does the jury process allow a useful description of a broad issue to be provided?</i>	88	88	95	86	89	ns
<i>Q.120 Was there adequate time provided for a thorough review of each topic?</i>	93	86	87	80	87	ns

**Table 15.** Mean scores for competence assessment criteria.

(Note: scores are transformed from their raw state into percentages in the table.) (ns: no significant difference between locations,  $\alpha = .05$ , two-tailed)

### 4.3 Personal asset values

By way of introduction to the axiological value concepts of the VJ process, jurors were asked in Section 2 of the instrument to identify the strength of their attachment to two important sets of personal assets: firstly, their homes, and secondly, its contents. The underlying premise concerning people's home properties is that 'market value' is probably only a poor reflection of the price incentive required for them to sell under conditions where they are not otherwise willing to sell. On the suspicion that even the most unwilling seller would be prepared to forgo residing in their home for a large enough sale price, jurors were asked to consider what price would be sufficient to encourage them to sell immediately. Any premium between the 'market value' and the price required to divest the home would then reflect a strength of personal attachment to the asset: a form of axiological value.

Only 71 of the total 100 jurors indicated that they owned (or were buying) their place of residence. The remainder were in rental accommodation and so the question about selling was not valid to the lessees amongst the jury members. To avoid excluding any of these participants, a second brief set of questions within Section 2 concentrated on how much of an increase in their insurance costs they would be prepared to pay rather than forgo insuring their contents. This was expected to elicit a similar emotive response from the individual jurors.

Due to the generalised nature of this set of questions, which introduced an intervening variable – home ownership – the following assessments are primarily focussed on the descriptive analysis of the responses.

Of the 71 home owners/buyers, six indicated that their properties were actually currently for sale. With the exclusion of these, the mean premium required to encourage people to sell immediately was 29% over the 'market value'. By adding back the prices expected by those who were willingly looking for a buyer for their property, this figure was diluted slightly to 27%. Amongst all of the homeowners (including those selling) the highest mean premium was associated with the Strathfield jury (44%). The figures for the other locations were substantially lower: Dubbo 24%, Mudgee 21%, and Warren 18%. The figures suggest a greater degree of personal attachment to real estate in Strathfield, possibly because the area has a reputation as a well-established 'garden suburb' with a strong proliferation of historic residences.

Despite nominating a mean premium of 29% as adequate enticement to sell, 36 of the 65 unwilling sellers actually indicated that they *would* be willing to negotiate on the premium they had nominated. In other words, these homeowners were acknowledging their attempt at

strategic behaviour even under the hypothetical circumstances associated with the jury exercise. The specific question put to them was whether they would be willing to negotiate their nominated price down by 5%. On the basis of the affirmation of these 36 'negotiable' hypothetical sellers the actual premium across all locations becomes approximately 26%. The location with greatest willingness to negotiate was Dubbo, and Warren showed the least. This result may be reflective of not only an older jury sample in Warren who were less inclined to change houses, but may also be associated with a longer time spent in residence at the juror's current home. In Warren the mean period of residency was 12.7 years. This was very similar to the figure for Strathfield, but reduced to 10.7 years in Mudgee and only 8.1 years in Dubbo. Overall the mean period of residency was 11.0 years. This figure was somewhat diminished by the influence of lessees, whose average residency was only 5.5 years. By excluding the figures for the lessees the average residency increased to 13.3 years across all locations.

With regard to insurance payments, the maximum mean acceptable increase in annual costs to insure their dwelling (or, for lessees, their contents) was 94%. This represents the increase in premiums that people would accept rather than leave the item(s) uninsured. The option of reducing the level of insurance coverage was not included in the questionnaire instrument to avoid introducing a further intervening variable. Warren registered the lowest willingness to subscribe to premium increases, possibly because of the high incidence of older people in the jury group whose capacity to meet such hypothetical increased payments may have been limited. An analysis of variance confirmed that despite there being a broad range in the mean jury responses to this question (from 52% in Warren, up to 133% in Dubbo) there was no significant differences in the overall figures.

This section was the first in the sequence of the questionnaire which asked participants to provide comments on their feelings and impressions associated with the topic being addressed. Fifty-five made no comment. Of the remainder, almost half made only a brief remark typically along the lines of, 'we pay too much for insurance already'. Several jurors commented along similar lines to one Strathfield participant who stated that 'the amount of increase would greatly depend on one's income. That is, how much is this increase really going to hit my pocket and lifestyle?' Despite the comment, this particular juror indicated a willingness to pay up to five times more for his insurance policy rather than leave his home uninsured. The jurors' overall aversion to providing comments made statistical associations between the measure of personal asset values and comment rating problematic.

#### 4.4 Willingness to contribute to public causes

Prior to considering the stated quantum of values assigned by the jurors to any of the local public issues that formed the focus of the body of the VJ questionnaire, it was considered a fundamental requirement to inquire into the actual strength of commitment people held to various common public causes. After all, if the people representing the informed public view tend to register magnitudes of WTP that are beyond the constraints of their personal budget, then any extrapolation of those responses to the level of the broader community only magnifies the excessiveness. The result is then open to criticism on the basis that it had failed to operate within the basic principles of economic logic. Section 3 of the questionnaire sought to capture specific attributional and attitudinal characteristics of the participants regarding their willingness to contribute to a range of typical public causes. The causes were generalised rather than specific issues. The range of public causes identified to the jury members related to issues of the following nature: welfare, sporting, religious, educational, environmental and health.

The jurors were firstly asked (question 16) to indicate how much they, on behalf of their household, had actually contributed to these, and any similar causes, in the past twelve months. Because a central focus of the VJ trials was environmental management, it was also important to identify how much of these contributions was actually applied to issues of an environmental nature (question 17). For a variety of reasons the past twelve months may have been an atypical period in the lives of many of the jurors. To contend with this, they were also asked to indicate how much they *could* have contributed to the range of public causes if adequate opportunity had arisen (question 18).

The results of the first two questions (Table 16) indicate that the participant's mean annual contribution to such causes was \$418 and \$40, respectively. Based on the \$31 000 median average annual household income across the four locations (Australian Bureau of Statistics 1998a), these figures represent a willingness to contribute around 1.3% and 0.1% of pre-tax total income to such causes. Assuming an average 25% total income tax contribution rate, these levels of commitment to public causes rise to around 1.8%, and 0.2%, of post-tax income, respectively. People's willingness to contribute to environmental causes appears to represent around 10% of their total public cause budget. There was no significant difference between the four locations based on either of these two categories of questions. But the disproportionate impact of the relatively large contributions indicated by a small number of the participants was demonstrated by the considerable differential between the mean and median figures for each of the two sets of responses. Based on the medians, the jurors' actual total annual contributions amounted to only \$250 per household, and the environmental component of this was

considerably less than the mean figure, at only \$2.50. By adopting the latter set of figures, it is evident that for the *median voter* in the juries, the willingness to contribute to all public causes represented around 0.8% of pre-tax income, and of this amount, environmental causes received contributions equal to only around 1%. Once again, there was no significant difference between the medians for both categories of figures across the four locations.

Location	Juror's total public contributions in past year (\$)			Juror's environmental contributions in past year (\$)		
	Mean	Median	Range	Mean	Median	Range
Warren	495	200	50-3000	22	0	0-120
Dubbo	398	300	18-2500	35	10	0-200
Mudgee	424	250	0-2000	64	10	0-750
Strathfield	359	200	10-2000	37	5	0-500
Total	418 <sup>ns</sup>	250 <sup>ns</sup>	0-3000	40 <sup>ns</sup>	2.50 <sup>ns</sup>	0-750

Table 16. Juror's actual contributions to various public causes. (ns: no significant difference between locations,  $\alpha = 0.05$ , two-tailed)

A multiple bivariate correlation analysis of *total actual contributions* and the range of socio-demographic characteristics (including their environmental orientation), confirmed that there were no significant associations amongst the data. A multiple regression of the contributions against the various socio-demographic data identified a moderate degree of association ( $r = 0.325$ ). This analysis was undertaken to determine how well the combined socio-demographic characteristics acted as predictors of public cause contributions. The coefficient of determination ( $r^2$ ) was only 0.106, indicating that factors other than the socio-demographic ones investigated in this study are responsible for up to 90% of the motivation for people to contribute to public causes. The regression equation is:

$$CONTRIB(\$) = 1003 - 89\ LOCN + 170\ GENDER - 3\ AGE - 73\ BIRTHPL - 71\ RESID + 4\ EMPLOY - 254\ QUAL + 27\ ENVIR$$

Where, *CONTRIB* is the total public cause contribution, and:

- LOCN

= location

GENDER

= gender

AGE

= age

(Warren = 1, Dubbo = 2, Mudgee = 3, Strathfield = 4)

(male = 1, female = 2)

(years)

<i>BIRTHPL</i>	= birthplace	(Australia = 1, overseas = 2)
<i>RESID</i>	= residential status	(1 = own/buying, 2 = renting)
<i>EMPLOY</i>	= employment status	(1 = employed, 2 = not in workforce)
<i>QUAL</i>	= post-school qualification	(1 = trade qualification or higher, 2 = nil or basic training)
<i>ENVIR</i>	= environmental orientation	(scale 0-5)

Although the correlation analysis indicated there were no significant associations amongst the variables, the relatively large *b* coefficient for post-school qualification suggested that the jurors level of education may have had the single most influential role in determining the extent of their contributions to public causes. An analysis of variance confirmed that a significant difference in contributions was associated with the participant's highest level of post-school qualification. The mean contribution for people with no (or limited) qualification was \$336 (median \$200) and for higher qualifications it was \$536 (median \$300).

A bivariate analysis of the environmental causes contributions with each of the socio-demographic characteristics indicated no significant association amongst the categories. Due to the relatively small quantum of environmental contributions across all locations a multiple regression of these contributions against all of the socio-demographic data categories would have provided an inconsequential result. Instead, a regression of the environmental contributions against the total household public causes contributions was executed, resulting in a coefficient of .327 ( $r^2 = 0.107$ ). A t-test of the coefficient indicated that the level of environmental cause contributions was significantly associated with that of total public contributions. For these two variables, the regression equation is:

$$ENVIRCONTRIB(\$) = 14.23 + 0.06 CONTRIB$$

Where *ENVIRCONTRIB* is the level of environmental cause contributions and *CONTRIB* is the amount of total annual contributions to all public causes.

In response to the question concerning how much each household *could* have contributed to all public causes in the previous year, the results (Table 17) indicate that the mean rate of payments may have been up to 51% higher. This signifies that the \$418 figure of mean actual contributions could have been increased to around \$632 if participants had been given adequate opportunities to make such payments. The median figure increased by a lesser amount (although it represented a greater proportion) from \$250 to \$400.

Location	Total actual public-cause contributions (\$)		Total potential public-cause contributions (\$)			
	Mean	Median	Mean	% increase over actual contribution	Median	% increase over actual contribution
<i>Warren</i>	495	200	571	15	225	13
<i>Dubbo</i>	398	300	749	88	500	67
<i>Mudgee</i>	424	250	639	51	500	100
<i>Strathfield</i>	359	200	560	56	300	50
<b>Total</b>	418	250	632	51	400	60

**Table 17.** *Comparison of juror's actual and potential contributions to all public causes per annum.*

Assuming that the scale of projected increases in potential contributions for all public causes also holds for juror's willingness to contribute to environmental causes, the maximum that people are likely to contribute in response to environmental issues is \$60 (if the mean figures are adopted), or only \$4.16 if the medians are used. The data collected from the VJ trials indicate therefore that the *median voter's* willingness to contribute to public environmental issues in any one year may be constrained to less than \$5. If the impact of outlier contributions is absorbed into the analysis and the mean figures are adopted instead, this contribution rate may be as high as \$60. At best, the data are indicating that the upper bound of people's willingness – and ability - to contribute to such causes is considerably less than \$100. Because of the magnitude of this bounded budget constraint this has significant implications for environmental valuation estimates that are based on the WTP format.

For many people, estimates of the scale of their annual financial contributions to various causes represents an incomplete assessment of their level of commitment. In addition to monetary contributions many also provide considerable donations of time as volunteers. To limit any potential participant distrust of the economic assessment framework upon which the VJ model is based, the jurors were also asked to indicate how much time they had given to public causes in the previous 12 month period (Table 18). Accounting for the value of people's time is an element of an alternative valuation model: the Travel-Cost method (TC). It is not relied on as a principal indicator of value in this study.



	Juror's annual donation of time to public causes (hours)	
Location	Mean	Median
<i>Warren</i>	193	90
<i>Dubbo</i>	228	80
<i>Mudgee</i>	166	100
<i>Strathfield</i>	260	50
<i>Total</i>	212 <sup>ns</sup>	75 <sup>ns</sup>

**Table 18.** *Juror's annual donation of time to public causes*  
( ns: no significant difference between locations,  $\alpha = 0.05$ ,  
two-tailed)

There were found to be no significant correlations between the allocation of time and any of the socio-demographic characteristics. Beyond this, there was a significant association between time donations and the quantum of household financial support for public causes. Although the coefficient of determination was relatively small ( $r^2 = 0.05$ ), the regression equation demonstrates a positive association between the levels of time and financial commitments:

$$TIME(hours) = 146 + 0.158 CONTRIB$$

Where *TIME* is the number of hours dedicated to public causes by each household per annum, and *CONTRIB* is the amount of annual monetary contributions to such causes.

To see how people might preferably allocate their time resources amongst the various competing public claims, question 20 asked them to rank their preferences from the range of generalised options: welfare, sporting, religious, educational, environmental, and health issues. Overall, welfare concerns ranked highest, followed by health, education, environment, sport, and religious causes. There was no significant variation in these rankings between the locations. Multiple bivariate correlations of the ranks against the various socio-demographic categories indicated a number of significant associations existed. Allocation of potential time resources to educational causes was highest in Strathfield followed by Mudgee, Dubbo and Warren. This tended to follow the trend of the post-school qualification data. Health rated significantly higher as an issue to Australian-born participants than to those who were born overseas, and sport was considered a more important activity for less qualified jurors. Time allocations to religious causes tended to increase with age, and there was also a significant negative association between religious ranking and that of environmental issues. It appears that the more important religion is, the less important the environment becomes. Less surprisingly, people with a greater pro-

environmental orientation tended to rank their allocations of time to environmental issues higher. Overall, the ranking of environmental time allocations was moderately associated with the combined influence of the range of socio-demographic indicators used in the study ( $r = 0.32$ ). Along with this, the coefficient of determination ( $r^2 = 0.102$ ) suggests that up to 90% of the reason for people's dedication of time to environmental issues is related to other factors. The regression equation for estimating the ranking of time allocations to environmental causes (from amongst those potential causes referred to in this study) is:

$$\begin{aligned} RELRANKENVIRTIME(\text{ranking } 0-6) = & 5.72 - 0.156 LOCN - 0.047 GENDER - 0.002 AGE - \\ & 0.249 BIRTHPL + 0.034 RESID + 0.050 EMPLOY \\ & + 0.006 QUAL - 0.441 ENVIR \end{aligned}$$

Where *RELRANKENVIRTIME* is the relative ranking of environmental time allocation, and the *x* variables are as indicated for the earlier regression equation.

To determine how closely aligned time allocations were with monetary contributions, the final question in this section asked the jurors to hypothetically distribute \$1000 between the various competing causes. The data confirmed a consistently significant correlation between the previous rankings and the monetary allocations. This was despite the fact that health donations replaced welfare time allocation as the major hypothetical monetary ranking. The mean allocation of the \$1000 was: health \$232 (median \$200), welfare \$212 (\$200), education \$204 (\$200), environment \$171 (\$100), sport \$92 (\$50), and religious causes \$89 (\$0). Several significant associations were evident in the correlation of the outcomes with the socio-demographic data. Welfare rated as a more worthy recipient amongst higher qualified participants. Sport was much more important to males than females. The level of allocation to religious causes diminished as environmental sympathies increased. The level of education donations increased in proportion to the participant's actual post-school qualifications. Conversely, the allocation to educational causes reduced with age. The quantum of environmental donations was significantly higher in Strathfield (mean \$208), and reduced with distance away from Sydney: Mudgee \$187, Dubbo \$158, and Warren \$128. Consistent with previous results, the hypothetical allocation of financial resources to environmental causes increased in line with the level of environmental sympathies.

From the perspective of the objectives of this study, the most important finding from the figures in this section of the questionnaire is the delimitation of the amount of spending people are prepared to allocate to environmental causes. The jurors identified a willingness to contribute 17.1% (\$171) of their hypothetical budget to the environment. Holding this percentage figure

constant and applying it to the actual level of spending on all public causes suggests that the participant's mean annual willingness to contribute to environmental causes reaches an upper bound at around \$71. This figure represents 17.1% of the mean amount of actual contributions to all public causes in the previous 12 months (\$418, as per table 17). Adopting the median figures as a fairer representation of people's intentions generates an allocation potential of only \$25, being 10% (\$100/\$1000) of the actual median contributions to all causes for the previous year. The environmental contribution rate increases to some extent if the total *potential* annual contributions (table 17) are used as the basis for calculation. In this case, the mean rises to \$108 (17.1% of \$632), and the median to \$40 (10% of \$400). Although the median figures provide a more conservative estimate of the upper bound of people's willingness to contribute to environmental causes, even by adopting the higher estimate, it is clear that typical annual contributions are unlikely to exceed \$108. Once again, this has significant consequences for estimates of environmental values that are based on the WTP format. Essentially, people's budgets may become exhausted after very few (or possibly only one!) requests for assessment of their personal willingness to contribute to avoid some form of environmental harm.

#### 4.5 The problem of dichotomous voting

A very common form of voting, typical of public elections and referenda, involves making choices from a constrained list of options. Often, the choice is of dichotomous alternatives, and the vote is therefore one of an 'either/or' nature. This is also the case with most judicial decisions that confront juries. The accused is *either* guilty *or* innocent. Shades of guilt are excluded from the range of options. The mechanism for determining the aggregated verdict in judicial trials is usually based on unanimity. But courts sometimes waive this, and allow some form of majority verdict to operate. The problem is one of ensuring fair case assessment without compromising on standards of justice. The most common alternative methods of determining the collective will of the assessors, apart from unanimity, are majority (50% + 1), special majority (50% + ?), consensus (those who do not necessarily agree may also not necessarily oppose the decision), and median voting (the decision of the median voter represents the common choice of all).

To demonstrate the imprecision with which each of these alternative mechanisms works, Section 4 of the questionnaire asked jurors to reflect on a recent, high profile legal case, that of the accusation that OJ Simpson was responsible for the death of his wife and her acquaintance. The jurors were asked to vote on whether they considered Simpson was guilty of the crime. They were then asked to nominate their level of certainty.

Overall, 87 jurors voted that he was guilty. The other 13 voted 'not guilty'. Warren was the only location that voted him guilty unanimously. In Dubbo the vote was 19/7, Mudgee 24/1, and Strathfield 20/5. In some judicial trials where the jury is formed of 12 members a vote of 11/1 is sometimes acceptable. On this basis, Mudgee would also have found Simpson guilty. But a voting equivalent to 8/4 would be required before he would have been convicted in both Dubbo and Strathfield.

Majority voting would have found Simpson guilty in each location. Similarly, on the basis of median voting he would also have been found guilty by each jury. On the strength of the overall vote against his innocence it is also likely that on a consensus basis he would also have been found guilty.

The only significant correlation evident between the jury verdicts and the socio-demographic characteristics of the jurors was based on gender. Of the 55 females in the groups only four (7%) claimed Simpson was not guilty. This same assessment was made by 9 (20%) of the males. On this basis, an all-male jury would have needed a 9/3 voting system to be in operation before he would have been convicted.

The scale for assessing the juror's certainty of Simpson's guilt ranged from '0' (innocent without doubt) through to '5' (guilty without doubt). Neutrality was expressed by a score of 2.5. The overall mean score was 3.66, with no significant differences evident between locations. On this basis, the mean score reflects a position of moderate – but not strong – certainty. In fact, the score is less than half-way between neutrality and certainty of guilty. Only two significant correlations exist between the scale of guilt and the juror's socio-demographic characteristics. People born overseas were more likely to score Simpson definitely guilty, and females were also more convinced of his absolute guilt than males.

Any one of a range of voting alternatives may have been used to determine Simpson's fate. Most would have found him guilty, but some, by their inherent nature, would have acquitted him. The challenge for any jury system is therefore to devise a fair and competent measure of the intensity of aggregated juror 'conviction'.

Consistent with previous requests for comments, only 44 of the jurors made any remarks concerning Simpson or the voting system. Most comments were brief and confirmed juror's assessments that he was guilty. Some, interestingly, hinted at the mechanism by which people decide guilt or innocence. 'You could see it in his eyes', was a not-uncommon type of response. All of the extended commentaries reiterated that Simpson was guilty although some showed a

degree of scepticism toward the actual judicial decision-making process, suggesting that for political reasons, he had to be found innocent. There was no significant correlation between the strength of certainty concerning Simpson’s guilt and the level of commentary.

#### 4.6 National environmental contributions

Section 5 of the questionnaire required the jurors to consider their willingness to contribute to a specific Federally-managed fund for the conservation of significant environmental features of national importance. They were asked to consider the Government’s request in two ways (Table 19). Firstly, as a once-only payment, in the form of a levy on personal tax scales or as a reduction in welfare payments. Then, as an on-going annual impost.

Location	Once-only environmental levy		Annual environmental levy	
	(\$)		(\$)	
	Mean	Median	Mean	Median
<i>Warren</i>	122	38	13	1
<i>Dubbo</i>	233	80	62	20
<i>Mudgee</i>	148	50	70	20
<i>Strathfield</i>	234	100	49	50
<b>Total</b>	185 <sup>ns</sup>	55 <sup>ns</sup>	49 <sup>ns</sup>	20*

**Table 19.** *Juror’s willingness to contribute to a national environmental fund.*  
(ns: no significant difference, \* significant,  $\alpha = 0.05$ , two-tailed)

The trend in the size of the nominated amounts broadly reflects those evident in the earlier levels of actual contributions, especially for the medians. From these results, there appears to be some likelihood that if the Government actually arranged to collect levies of the scale indicated, then most people would suffer a form of exhaustion of their environmental contributions budget, leaving little to spare for other non-government projects. The common complaint may be along the lines that local environmental causes will suffer because people have already contributed to the national fund.

The figures also confirm that people’s annual environmental contribution budget may be fully eroded at figures well below the level of \$100 per annum. The medians in particular, reflect the earlier conclusions that environmental causes could expect to attract a maximum annual contribution rate of up to only \$40, but this may depend on whether the donors consider the payment to be once-only and final, or likely to be on-going. Notably, the mean value of once-

only levies is 3.77 times the continuing impost, or 2.75 if the medians are adopted. This suggests that people may be willing to capitalise up to four years worth of contributions as long as the charge remains once-only.

Correlation analysis between the two forms of environmental levies and the actual level of juror's contributions to *all* public causes, indicates a strong link between the categories. In other words, people were likely to offer a higher voluntary contribution rate to the Federal environmental fund if they already donate to public causes. Notably, the same trend is not evident for those who indicated that they had already contributed to environmental causes in the past year. This may be confirmation of a form of specific-cause budget exhaustion.

Based on people's actual past-year financial contributions to all public causes, the regression equation indicating the mean measure of willingness to contribute to the a national environmental fund is:

$$ENVIRFUND(\$) = 80.44 + .251 PUBCONTRIB$$

Where *ENVIRFUND* is the level of national environmental fund contribution commitment, and *PUBCONTRIB* is the amount actually contributed to all public causes in the previous 12-month period. The significant correlation ( $r = 0.426$ ) between the two variables suggests that people's real contributions may be a very useful measure against which to validate the size of their hypothetical ones. In other words, the suggestion that people may act strategically or *free ride* under conditions where their pledges are not necessarily to be honoured, does not appear to hold true in this case.

Only one significant correlation was evident between juror's willingness to pay the once-only environmental levy and the various socio-demographic categories. It was that people with lower levels of post-school qualification were likely to nominate lesser amounts. It seems likely that this is a proxy for contribution rates diminishing *pro-rata* with lower household income levels.

Fifty-one participants offered comments on the environmental levies. A common theme was that most were distrustful of once-only levies because they invariably become permanent imposts. Overall, there was no significant correlation between the strength of people's comments and their nominated level of environmental levy contributions.

#### 4.7 The value of a dialysis machine

In Sections 6 and 7 of the questionnaire jurors were asked to consider their intensity of preferences relating to the operation of a kidney dialysis machine in their nearest district hospital. Section 6 indicated that a machine was to be purchased to add to the one already in operation. It would provide additional dialysis capacity, even though the district had managed to satisfy its general needs with the one machine to date. Section 7 indicated that there were already two machines in operation in the hospital and that due to a degree of excess capacity one of them was to be removed to another hospital in need of a machine. New dialysis machines cost approximately \$25 000. The purpose of the exercise was to identify whether the juror's value function was asymmetrical, as suggested by Tversky and Kahneman (1981), with losses being more highly valued than equivalent gains. The jurors were not advised of the purchase price.

##### 4.7.1 Value under conditions of loss

The initial question considered by the juries was whether, under the circumstances, the hospital should proceed with the acquisition of the additional machine on the basis that the local community would be canvassed for support donations. In each of the locations the consistent response was affirmative, with an average 'yes' vote of 92%. When asked how much each of the jurors would willingly commit to such a fundraising program they offered a mean of \$53 per household. The median was much lower at \$20, and the overall range, \$0-1000. There were no significant correlations between the amounts pledged and any of the socio-demographic characteristics, including location. The multiple correlation analysis indicated that the combined socio-demographic characteristics were only moderately associated with the scale of the pledged amount ( $r = 0.264$ ). The regression equation was:

$$DIALPLEDGE(\$) = -14.00 + 1.42 LOCN - 17.42 GENDER + 1.32 AGE - 0.98 BIRTHPL + \\ 36.88 RESID + 22.76 EMPLOY - 34.62 QUAL$$

Where *DIALPLEDGE* is the pledged amount, and the *x* variables are the same as indicated in Section 4.4

Notably, there was a significant correlation between the size of juror's pledges and their actual level of public-cause contributions in the previous 12-month period ( $r = 0.353$ ). Once again, this tends to confirm that people who are willing to pledge more, are also more likely to actually

give more to such causes. Regressing the pledged amounts against the actual contributions results in the following equation:

$$DIALPLEDGE(\$) = 21.18 + 0.08PUBCONTRIB$$

Where *DIALPLEDGE* is the mean level of the expected once-only pledge to acquire the dialysis machine, and *PUBCONTRIB* is the actual level of contributions made to all public causes in the previous 12-month period.

The following question asked jurors to consider their willingness to pledge a continuing annual donation to purchase the machine over an extended period, similar to a hire purchase contract. The overall mean pledge was \$18.05 (median \$10.00), with a range of \$0-160. The annual mean pledge was 34% of the once-only figure, which was generally consistent with the findings of the environmental fund contributions noted previously. There was no significant correlation between the annual dialysis machine pledges and any of the socio-demographic characteristics.

Location	No. of households <sup>1</sup>	Once-only pledge		Annual pledge	
		Total contributions based on the mean pledge (\$)	Total contributions based on the median pledge (\$)	Total contributions based on the mean pledge (\$)	Total contributions based on the median pledge (\$)
Warren	1 235	85 264	61 750	24 490	12 350
Dubbo	12 677	404 143	253 540	212 593	63 385
Mudgee	6 295	217 807	125 900	102 482	62 950
Strathfield	8 744	666 642	174 880	169 983	43 720
Total	28 951	1 521 954	579 020	522 565	289 510

**Table 20.** Total expected contributions to fund the purchase of a dialysis machine, by location. (1. source: Australian Bureau of Statistics 1997)

Applying the pledged amounts across the population for each location generates total likely contribution estimates for both the once-only and annual amounts (Table 20). The scale of the difference between mean and median pledges is magnified in the results which confirm the



suspicion that a substantial difference exists between the two figures due to the impact of outlier bids. Regardless of this, the aggregated pledged amounts would be adequate to acquire the necessary machine in each location. In fact the total mean amounts would be adequate to purchase three machines in Warren (median 2), 16 in Dubbo (median 10), 8 in Mudgee (median 5), and 26 in Strathfield (median 7). On this basis, the mean figures represent a rate of dialysis machine provision of one per 336 households in Strathfield, followed by 416 in Warren, then 786 in Mudgee, and 792 in Dubbo.

Adopting a variation of the typical personal preference-based economic approach, jurors were asked to consider how much they considered each household in the Local Government Area should be required to contribute through their annual rates, to support the acquisition costs of the machine. Once again, no indication of the actual purchase price was given. The reason for this was to establish the magnitude of the health-related contribution budget that jurors considered prevailed within their Municipality. In this sense the participants were being asked to act as value consultants, whose recommendations would apply to the whole community. For households where tenants resided, jurors were asked to assume that the Council rates would be passed on to the lessees by the landlord, so that all households were treated equally in terms of their rates of contributions.

Under these conditions, the overall mean estimate of the once-only contribution fell by 35% from \$52.57 to \$34.19 (median \$20.00 down to \$10.00). This suggested that in their role as value consultants, the jurors were mindful of the range of household payment capacities throughout the local area. Conversely, it appears they may have generally considered that their personal contribution capacity was greater than that of the typical local household. There were no significant differences amongst the means but there was a very strong association between the juror's estimate of their personal capacity to pay and the magnitude of the recommended figure for each household ( $r = 0.925$ ). It suggested that people who are willing to contribute more may also have raised expectations about the capacity of their fellow residents to pay. The regression equation is:

$$MUNDIAL(\$) = -10.44 + .85 PERCOM$$

Where *MUNDIAL* is the juror's recommended level of per-household contributions for their municipality, and *PERCOM* is the measure of juror's personal commitment to the payment.

Similarly, when they were asked to indicate their recommended measure of annual contributions payable per household, the mean figures also fell by around 35%, from \$18.05 to \$11.56

(median \$10.00 to \$5.00). Again, the means showed no significant variation, and the annual contributions remained very highly correlated with the juror's personal willingness to contribute.

Comments made by the participants about the dialysis machine scenario tended to concentrate on the notion that such equipment should be supplied by Government. Fifty-seven jurors provided no comments, with the remainder mainly offering only brief ones. Those who made extended remarks tended to bemoan the fact that many public services are becoming user-pays based, and that smaller communities were more likely to be impacted by this approach. There was no significant correlation between the strength of the comments and the scale of pledged contributions.

#### 4.7.2 Value under conditions of acquisition

Section 7 of the questionnaire explored how willingly the jurors would permit the removal of an additional dialysis machine from the local hospital. The basis for removal was that a machine was required elsewhere in the State, and the Government was not in a position to provide a new one to that other location at the time. Overall, the jurors voted 59% against the relocation, but the rate varied considerably between locations. Warren voted 88% against, followed by Dubbo 73%, Mudgee 48%, and Strathfield only 28%. The trend indicates that smaller, more remote locations are less likely to entertain the option of losing an important public asset. As proximity to Sydney increased, the jurors were less adamant about the loss of the machine.

Overall, there were no significant differences between the means of the amounts nominated in each location to help support the retention of the additional unit. This is somewhat counter to the expectations generated by the large degree of indifference to the loss noted in the previous question. It suggests that, despite the considerable indifference evident in the Mudgee and Strathfield responses in particular, jurors were still willing to pledge monetary support to retain the unit in both locations. The aggregated mean for all locations was \$21.37 (median \$5.00), which ranged from \$12.00 (\$5.00) in Mudgee to \$29.90 (\$10.00) in Warren. The total range was \$0-300. There was a very strong correlation between juror's willingness to contribute to the purchase of an additional unit and the strength of their commitment to avoiding the loss of the existing unit ( $r = 0.530$ ).

Importantly, the mean figure pledged to support the fight against the removal of the extra unit was much less than the mean amount nominated to acquire an additional one. The reduction in the level of the pledge from \$52.57 (median \$20.00) down to \$21.37 (\$5.00) represents a fall of

60%. A similar rate of reduction was evident in the mean annualised pledge which fell from \$18.05 (median \$10.00) to \$8.02 (\$5.00). When the jurors were asked to adopt the role of value consultants on behalf of their local constituency in recommending a suitable measure of impost on resident's Council rates to assist with funding the retention of the existing dialysis unit, they provided a similar result. Their mean once-only figure of \$34.19 (median \$10.00) fell to \$15.40 (\$5.00). The annual amount recommended also declined by a similar rate from \$11.56 (median \$5.00) to \$6.68 (\$2.75).

Location	No. of households	Once-only personal household pledge		Once-only recommended payment per household	
		Total contributions based on the mean pledge (\$)	Total contributions based on the median pledge (\$)	Total contributions based on the mean recommendation (\$)	Total contributions based on the median recommendation (\$)
Warren	1 235	36 951	12 350	16 055	6 175
Dubbo	12 677	207 649	63 385	171 646	126 770
Mudgee	6 295	75 540	31 475	70 252	31 475
Strathfield	8 744	242 383	43 720	208 806	43 720
Total	28 951	618 682	144 755	445 845	144 755

**Table 21.** *Total expected contributions to avoid the loss of a dialysis machine, by location.*

The total expected contributions figures in table 21 become critical when cost-benefit analysis is applied to the exercise involving the hypothetical potential loss of the dialysis machine. The table shows the location-based magnitude of total willingness to pay and ‘value consultant’ recommended contributions. The decision criterion in a typical CBA exercise is that the project proceeds if a net positive benefit is evident. In this case, the project is the retention of the existing dialysis machine. By deducting the cost of a dialysis unit (\$25 000) from the total value indicated in each location, the decision outcome can be determined. The location with the greatest CBA-related threat is Warren. In each of the other locations, regardless of the option used for selecting the community’s assessment of value, a net positive figure is generated. In Warren, it is only by applying the maximum value estimator (aggregated mean personal contributions) that the unit may be retained within the local hospital. In particular, if the CBA were based on the median estimates, there is very limited likelihood of the machine remaining in Warren.

It is consistently evident from the results of the various dialysis machine-related questions that the jurors valued the acquisition of the additional unit much more highly than the loss of the existing one. It was stressed to each jury that the unit under threat of removal was not 'surplus' to local requirements, and its loss *would* place a strain on the remaining resources. Similarly, in the initial scenario it was reiterated that the current position reflected one of existing strain and that an additional unit *was* required, although its absence was not necessarily life-threatening. Overall, the results tend to run counter to Tversky and Kahneman's (1981) suggested outcome.

As a novel form of determining the measure of value lost by the removal of the existing dialysis machine, jurors were also asked to nominate an amount that would personally satisfy them that their loss had been fully compensated. In this they were once again acting as value consultants on behalf of the households of the municipality, with the amount nominated by them being hypothetically receivable as an *ex-gratia* payment from the Government to be made directly to each household. In effect, they were being asked for the magnitude of their willingness to accept a payment in return for their loss.

This was the first question – apart from commentaries - to which the response rate was less than 100%. In fact, only 47 jurors offered a figure, making any statistical assessment unreliable. The non-response rate was relatively consistent across the juries, suggesting that it was not a factor of the location, or delivery of the question, that had caused such a set of anomalous replies.

Juror commentary on the dialysis machine component of the jury exercise provided a strong hint of the problems associated with the question of personal compensation for a public loss. The rate of response to this opportunity to comment was somewhat higher than previous ones, with 59 of the jurors providing some level of comments. The common theme was the inappropriateness of asking people to indicate their personal measure of compensation for an asset that belongs to the broader community and not to any one household. The participants expressed a form of logical dissonance about the question. 'You can't ask for a payment for the loss of something that doesn't belong to you!', was typical of the remarks. The question was initially framed in a similar context to Ward and Duffield's (1992), concerning the measure of people's personal compensation for the loss of a public asset. In their case it was a scenic waterfall. Ward and Duffield found that respondents were willing to accept a payment of \$22 each as a measure of their compensation. In reality such a question may suffer from category error. It appears that the application of standard economic reasoning, which suggests that aggregated WTP and WTA measures are an appropriate basis upon which total value can be established, may not necessarily hold true for public goods that have an inherent collective character.

#### 4.8 The value of a historic building

If the willingness of people to participate in public activism is taken as a fair guide, axiological values are annexed to an almost infinite variety of features of the physical landscape. The *strength* of that attachment may be less obvious simply due to the often-narrow band of activists who demonstrate their intensities in such a public way, but the *range* of issues is nevertheless immense. Evidence for this is often provided by 'local' media which, in many locations, make a habit of raising contentious issues to the attention of the community. Although typically, under these circumstances the majority of those likely to be impacted by the decisions of policy-makers remain publicly silent, there is often a groundswell of private discontent created when the issues are brought to wider attention.

As a means of assessing the magnitude of attachment of the four juries to exemplary actions which hold the potential to impact on local public amenity, Section 8 of the questionnaire focused on the hypothetical demise of a specific, privately-owned, historic building in each location.

To firstly establish how well-known the structures were in each location, the participants were asked to nominate their degree of familiarity with the one in their vicinity on a scalar (0-5) basis. The buildings varied from an essentially redundant church in Warren (circa 1907), to historic functional residences in both Dubbo (c.1870) and Strathfield (c.1880), and an ex-staging house in Mudgee (c. 1859) that is currently used as commercial premises. An analysis of variance confirmed a very significant difference in the extent to which the buildings were recognised in each location: mean scores were, Warren 3.75, Dubbo 2.02, Mudgee 3.84, and Strathfield 1.74.

The introductory question was whether the private owner should have unfettered rights to do whatever they wished with the building in each of the locations. Sixty of the 100 jurors answered in the negative. There was no significant correlation between the aggregated preferences and the locations. This indicates that there was a consistent majority of people in each jury who believed that, regardless of the actual building, public interests should not be completely subjugated to private ownership rights. The finding was supported by the fact that there was no significant correlation between the collective answer to this question and the degree of familiarity that the jurors had with each of the particular structures. There was also no correlation between the sentiment expressed and any of the juror's socio-demographic characteristics across the locations. The negative sentiment was therefore of general intent, and consistent throughout the juries.

When commentary was requested, the jurors gave a stronger response about this issue than to most of the earlier ones. While the total number of jurors willing to comment was generally consistent with the figure for the other commentary opportunities, the 48 who placed their remarks on paper did so with more passion than previously. Many more offered extended comments rather than brief ones. The correlation analysis confirmed that the comments were very strongly against unrestricted rights, rather than in favour of them. Typical was: '[The owner's should] definitely not!! [be allowed unfettered rights]. They should have the freedom to enhance the place and make it comfortable, but in keeping with its history'.

The following question asked the jurors to provide an assessment of the measure of compensation hypothetically due to the local community should the demolition or removal proceed. It was suspected that the amounts nominated may bear some association with the current market value of each of the properties. For this reason, an estimation of the fair market value<sup>5</sup> for each of them was made (Table 22) using standard valuation techniques, namely, comparison with recent local sales evidence, and capitalisation of estimated rental streams.

Location	Value of land and building	Land component	Building component
	(\$)	(\$)	(\$)
Warren	150 000	50 000	100 000
Dubbo	200 000	50 000	150 000
Mudgee	300 000	100 000	200 000
Strathfield	1 500 000	1 000 000	500 000

**Table 22.** *Estimated fair market values for a historic building in each location*

Even if demolition of the structure proceeded, the land component of total value would remain, and so it was important to differentiate the two components. On this basis, the jurors were asked to consider the value of the building if it were lost, exclusive of the value of the land. To standardise the results for fair comparison across the locations, the raw figures were transformed into percentages of the building-only market value in each case. In reality, even though a historic feature of a location's landscape is lost, it may not represent a unique example of its *genré*. In many cases, others may remain, under no threat of loss. To determine how valuable

5. The thesis author is a registered real estate valuer and followed standard valuation practices in deriving the figures.

the subject building may be when others remain, the jurors were also asked to confirm their assessments under the assumed condition that the loss was not necessarily a measure of extinction. A logical follow-on to these two questions was to determine at what level of initial provision the value of the subject building would fall to zero simply because – even after its loss - there were adequate numbers of similar structures remaining in the vicinity. The results of this sequence of questions are shown in Table 23.

Location	Premium for the loss of historic building (% of market value)		Premium for the loss of the historic building when at least one other similar building exists (% of market value)		Number at which premium falls to zero	
	Mean	Median	Mean	Median	Mean	Median
Warren	43	0	30	0	3	0
Dubbo	28	5	18	1.5	13	3
Mudgee	135	50	117	25	13	5
Strathfield	80	20	54	2.5	19	3
Total	71	12.5	55	2.5	12	3

**Table 23.** *The value of local historic buildings under threat of loss.*

There was clear evidence of a general public attachment to the buildings in question where mean scores were used to identify value premiums. In the case of Mudgee for example, the jurors expressed a desire for the owner to be charged a fee of 135% of the building’s market value (equivalent to \$270 000), for receipt into a fund for other community benefiting activities, to adequately compensate the public for their potential loss of social amenity. These figures represent the points of indifference at which, if appropriately compensated, there should be no broad public dissent about the premium charged in return for permission to proceed with the demolition or removal. Median scores generated results that were not so convincing. In fact, the Warren jury indicated that they felt no need to be compensated, implying that the building could be demolished at the owner’s prerogative. In Warren’s case, this result was not necessarily surprising given that there were so few representative samples of historic buildings to choose from when the background research into a suitable building for the topic was being undertaken. Despite the seemingly wide variation in mean scores, an analysis of variance confirmed that there was no significant difference between them. Across the locations, the overall mean score for the amount of compensation necessary to off-set the community’s loss of public amenity caused by the demise of the buildings was 71%. By exclusion of any zero

scores, the mean figure for the jurors who indicated at least some measure of positive public value, was 119%.

The value scores diminished considerably when jurors were advised that a hypothetical second example of the subject building existed in the vicinity. Overall, the reduction was from 71% to 55% based on the means. The median assessments, which had initially been very modest compared to the mean scores, fell away much more sharply from 12.5% to 2.5%. The reduction in premium due to the existence of the second building was most pronounced in Dubbo (a fall of 36% based on the mean), followed by Strathfield (32%), Warren (31%), and Mudgee (14%).

It was evident that public attachment to the buildings in question declined much more rapidly in Warren than in the other locations. The point at which the mean community compensation requirement fell to zero was under conditions where as few as only two other representative samples existed – therefore a total of three – in Warren’s case. In the other locations it was considerably more. The highest being Strathfield, where the mean was 19 (the building in question plus 18 others), followed by Mudgee and Dubbo, both with 13. The medians provided much more conservative estimates, with Mudgee reaching a zero premium at five, followed by Strathfield and Dubbo on three, and Warren registering zero as its score.

Graphical representation of the results provides a way of recognising the marginal value of the building in each location (Figure 3). The lines are based on the mean value figures. The figures confirm how the public benefit attached to the historic buildings is not confined to the initial unit of stock in the vicinity. There is a recognisable – albeit diminishing – public value evident for at least two units in each location, as is the case with Warren. The other locations demonstrate a much flatter gradient extending up to an x-intercept point of at least 13 for Dubbo and Mudgee, and 19 for Strathfield. The extended tail in three of the four lines indicates that there can be a very positive public sentiment toward quite a large group of such goods despite their control resting largely outside the public’s domain.

Based on the mean overall result, the general regression equation for the set of historic buildings is:

$$PREM(\%) = 76.9 - 5.9 NO$$

Where *PREM* is the percentage premium over market value for the building-only component of the site, and *NO* is the number of buildings in the district typical of the genre.



If the more conservative median figures are adopted instead, the equation becomes:

$$PREM(\%) = 16.7 - 4.2 NO$$

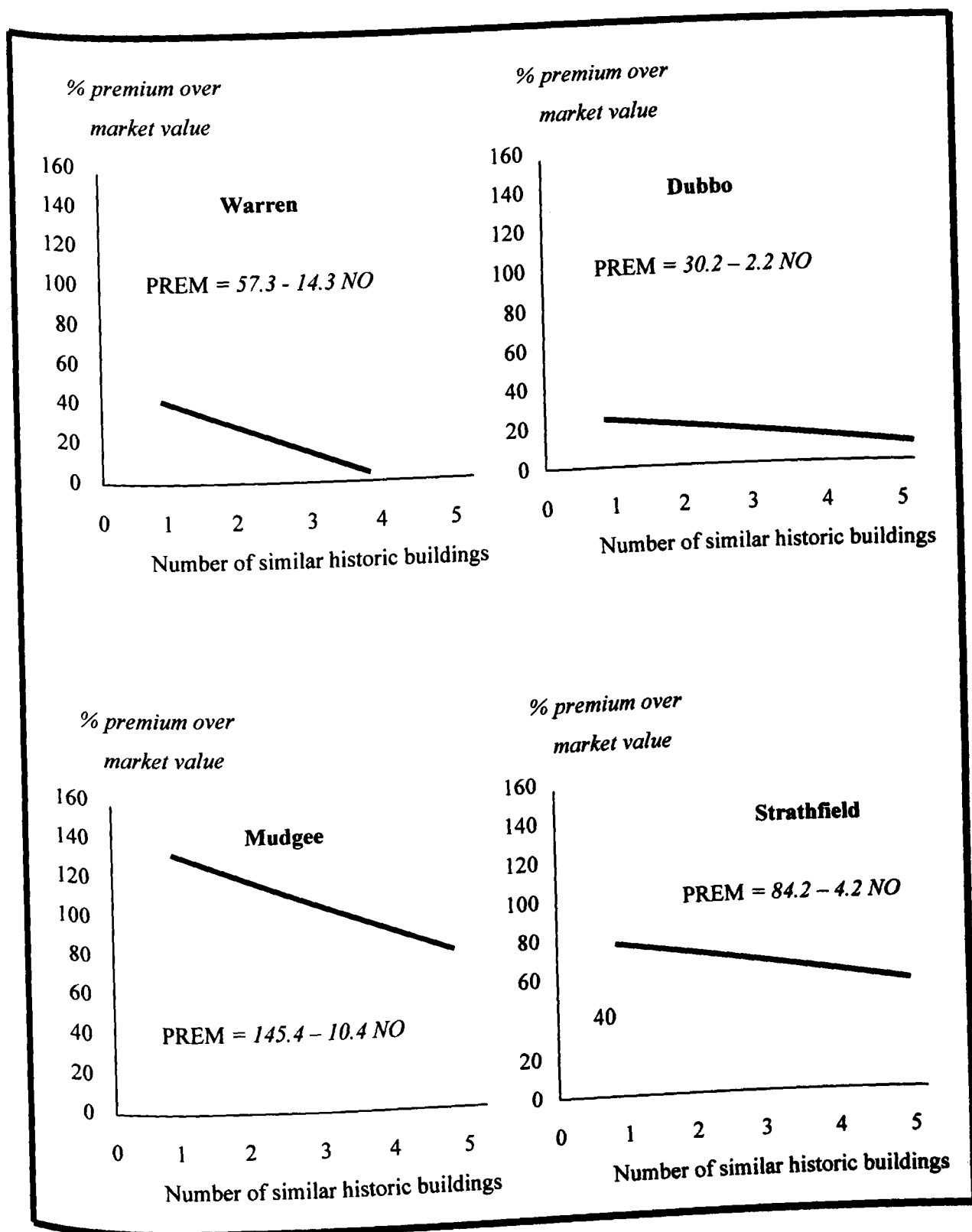


Figure 4. Mean premium compensation values for loss of a historic building, by location

The final direct question in this section of the instrument concerned the jurors' willingness to accept a direct payment from the building owner to the individual members of the local community as compensation for each person's individual loss caused by the demise of the building. It was framed in a similar way to an earlier question (in Section 7) that asked people to accept a personal payment from the Government to compensate them for the hypothetical loss of a dialysis machine. The juror's response was also similar: they largely failed to register any response to the question. Only 38 of the 100 jurors recorded a figure, making statistical analysis unreliable. Their unwillingness to provide answers to a second question of this framing suggests that the type of question was perceived to be inappropriate. Support for this conclusion was also provided in the free-form comments question that followed. In this set of responses, a relatively high number of jurors (59) registered a remark. The majority of the comments were extended, rather than brief, and tended to strongly articulate the notion that most communities had already lost too many of their local historical features to development. Correlation analysis confirmed a very significant positive association between the quantum of the commentary and the measure of the jurors' scale of compensation requirements. A recurrent theme in the statements also confirmed that jurors were confused about accepting a personal compensation payment for something in which they held an interest, but no ownership rights. Once again, this type of response pattern suggests that WTA questions that ask people for their measure of personal loss may be irrelevant when the loss is actually one that impacts collectively.

#### **4.9 The value of a war monument**

While communities may suffer as a result of the removal or complete demise of a particular feature of their local landscape, it is important to identify whether the *purpose* of the action has any significant bearing on the estimate of public loss. In the previous example, the historic buildings were threatened purely for the owner's personal purposes. It was made clear to the jurors that there were no structural reasons for the building to be hypothetically re-located or destroyed. So the loss was completely dependent on the owner's wishes.

Section 9 of the questionnaire asked the jurors to consider their assessments of values attaching to another type of public feature, their nearest local prominent war monument. In each case photographs and brief site descriptions of the structure were provided to the juries. The hypothetical scenario associated with the monument surrounded its potential sale to a real estate developer resulting in its removal to another site within the local vicinity. There it would be re-established as a thematic entrance to a new housing sub-division. Public access would be unrestricted and it would be maintained in its current condition in a purpose-built garden setting.

Using a range of assessments, jury members were asked to identify the scale of public value associated with the monument. To test for the impact of *purpose*, the jurors were then asked (in Section 10) to reconsider their estimates of value based on the alternative hypothetical scenario that the monument site was required for the installation of critical ambulance telecommunications equipment. Under these conditions, removal of the structure was necessary – although not mandatory – for the communications infrastructure to be installed. The ambulance service could, if necessary, relocate their equipment elsewhere but at a much greater cost. The jurors were offered a series of payment options which were intended to indicate if the value of the monument altered when a public-benefiting service was the motivating factor threatening the continuing location of the structure in its present position.

#### 4.9.1 Value under conditions of privatisation

The initial question put to the participants related to their level of familiarity with their local war monument (on a 0-5 scale). While each of the rural locations indicated a mean affinity of over 4 on the scale, the Strathfield jury registered a score of only 3.06, indicating a considerably lower level of knowledge about their particular monument site. An analysis of variance confirmed the significant difference between the mean score of Strathfield and the other locations. The jurors were then required to indicate if they would permit the sale of the structure to private interests under any circumstances. Overall, 88 of the 100 participants replied in the negative. The remainder were indifferent to the retention of the memorial in its present location. Seven of the 12 affirmative responses came from Strathfield. In each of the rural locations the negative responses averaged 93%. The impact of the seven positive replies was that 28% of the Strathfield group indicated a willingness to allow the monument to be re-located. As expected, this resulted in a very strong correlation between the answers to this question and the location from which they were generated ( $r = 0.302$ ). Multiple bivariate analysis also confirmed one other significant association between the responses and the juror's socio-demographic characteristics. A correlation between willingness to allow removal of the structure and participant's place of birth was evident ( $r = 0.206$ ). Only 9% of Australian-born jurors confirmed a willingness to allow the monument to be moved, but this figure increased to 29% for the overseas-born ones. The result suggests that retention of traditional public icons may be more problematic in cosmopolitan communities than in rural ones.

The reason for inclusion of the local war memorial in the juries' deliberations was that in the instrument pre-testing phase the monument component elicited the strongest set of responses from the jurors. It was evident that such a prominent public feature would hold considerable community goodwill. This finding was verified by the scale of responses provided by the four juries in the

formal trials. In the first set of value-related questions, the jurors were asked to estimate the amount that a developer would need to pay to acquire the monument, with any premium over the ‘market value’ being solely dedicated to a community-benefiting fund for local public purposes. In this way, the premium would act as a proxy for the compensable value being lost. In each location the trial juries were informed that the monument had an identifiable ‘market value’ of \$30 000 being the cost to build a replica of the existing monument. The developer’s choice would then be to continue pursuing the acquisition of the original structure, or have a replica built for a known price. As in the pilot test, the jurors gave very intense responses to the sale option. In each location the (mean and median) amounts required as public compensation for the sale were many orders of magnitude greater than the replacement cost (Table 24).

Community compensation required to allow the private sale and re-location of the local war monument (\$000)			
Location	Mean	Median	Range
Warren	2 661	110	10-10 000
Dubbo	6 144	1 375	10-40 000
Mudgee	2 713	500	20-10 000
Strathfield	45 485	250	0-100 000
Total	14 000	500	0-100 000

**Table 24.** Community compensation estimates for the loss of a war monument.

Overall, there was no significant correlation between the jurors’ estimate of compensable value and any of their socio-demographic characteristics. This suggests that people from a wide range of backgrounds are likely to oppose the privatisation of such a public asset. This was verified in the associated free-form commentary question which received a very high 73% response rate. Almost half of the jurors provided ‘extended’ and ‘lengthy’ comments about their views on the topic. None of the commentaries showed any positive sentiment toward the potential sale of the monument. Most confirmed that such a feature was akin to a sacred site, with privatisation acting as a form of defilement of the structure’s sanctity.

To confirm the magnitude of the marginal public benefit provided by additional units of war monuments in the local vicinity, jurors were asked to identify the value of the subject structure on the basis that a second, similar one would remain near-by even if the one being addressed was removed. A follow-up question asked them to also identify the point at which any additional memorials in the vicinity would hold zero compensable value. The results are shown in Figure 5. Due to the rather extreme expressions of mean values evident in the responses to

the previous question, the medians are adopted as a reasonable assessment of value measurement in this set of cases. For comprehensibility, the raw bid figures are transformed into multiples relative to the \$30 000 'market value' replacement cost price.

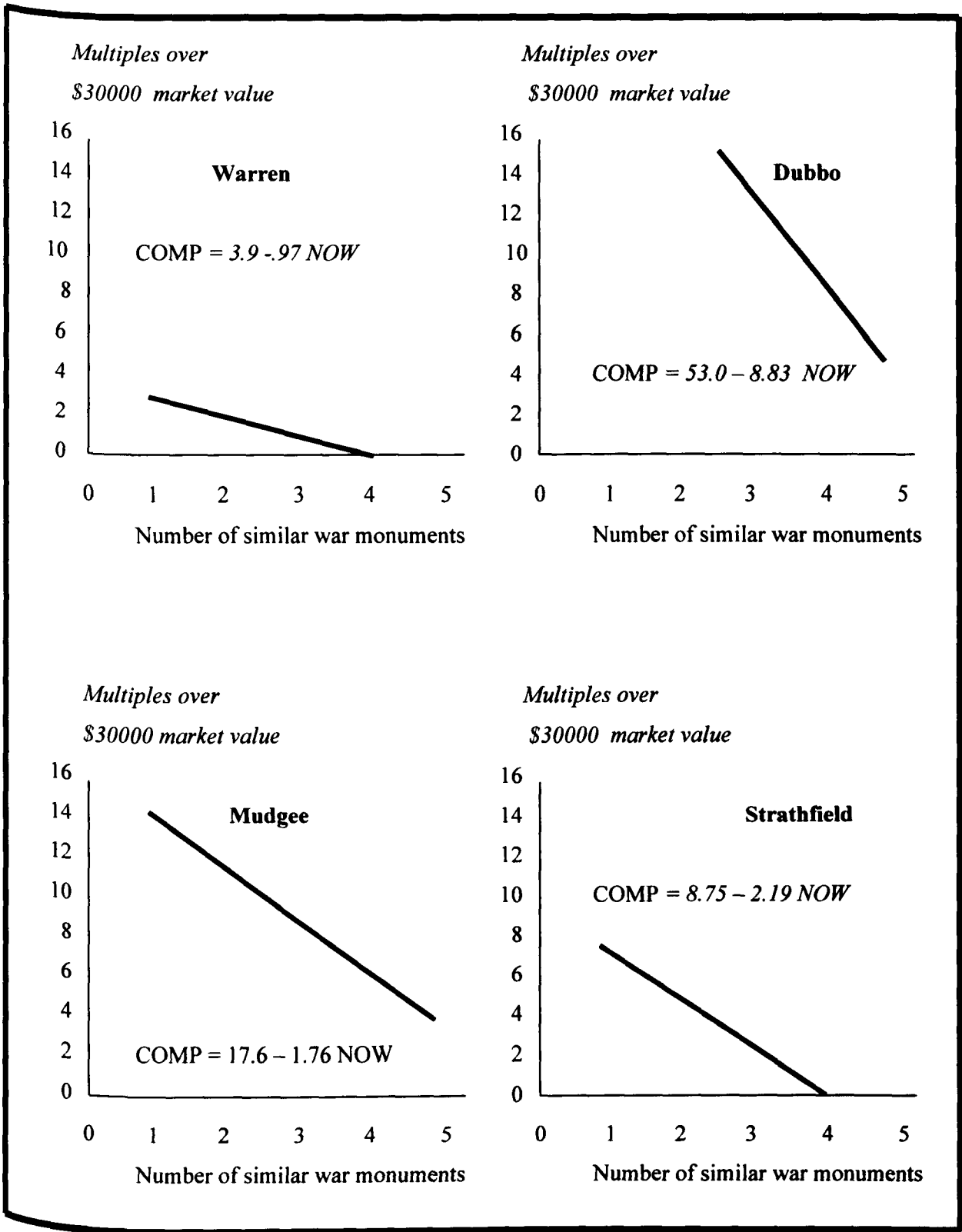


Figure 5. Median premium compensation values for loss of a war monument, by location

By incorporating all of the juries' median monument premiums, the overall regression equation is:

$$COMP(multiple) = 18.4 - 3.35 NOW$$

Where *COMP* is the multiple by which the compensable value exceeds the 'market value', and *NOW* is the number of war monuments in the local vicinity.

The extremely high values attached to the memorials confirm the view that people are reluctant to forgo the public benefit of such features unless it is for a figure that is probably well beyond the budget limitations of most developers. Despite this, the result also clearly indicated that at an initial provision level of between five and six units of monuments in the local area the community would not tend to protest about the developer's wish to acquire one of the structures for commercial purposes, as long as the remainder were left untouched.

When asked to indicate their personal willingness to pay into a 'fighting fund' to defend the retention of the monument against the threat of sale and removal, the jurors offered a mean overall figure of \$70.50 per household (median \$20.00). This figure ranged from \$137.50 (\$80.00) in Dubbo, to \$62.80 (\$40.00) in Warren, down to \$51.50 (\$10.00) in Mudgee, and only \$27.40 (\$0.00) in Strathfield. A correlation analysis confirmed there was a very significant difference in the median locational responses, although an analysis of variance indicated it was not so pronounced for the mean results. There were no other significant correlations between WTP to defend the retention of the monument and any of the socio-demographic characteristics, indicating that the positive intent demonstrated by people's willingness to contribute to save the local feature is likely to be widely dispersed in most communities.

When the estimated household contribution was regressed against the seven socio-demographic characteristics there was a relatively strong overall association evident ( $r = 0.259$ ). This indicated that a moderate degree of the motivation to contribute was aligned with the juror's background. The regression equation for predicting the level of such contributions based on people's socio-demographic attributes is:

$$WARCON(\$) = 325 - 25.9 LOCN - 23.0 GENDER + 0.44 AGE - 39.3 BIRTHPL - 52.0 RESID - 9.3 EMPLOY - 30.9 QUAL$$

Where *WARCON* is the expected level of household contributions to save the war memorial, and the x variables are as indicated in Section 4.4.

To validate the levels of contribution and check for the potential presence of *free riders* in the juries the pledged amounts were correlated with the actual levels of contributions to all public causes in the past year. There was a significant association evident ( $r = 0.247$ ), which generally indicates that those who offered to contribute more are also likely to be willing to actually support their intentions with real payments.

In a similar format to the previous questions, the jurors were re-presented with the personal WTP question based on an alternative scenario. In this, it was suggested that there were two similar war monuments in the vicinity. As a follow-up to this, they were then asked to identify the level of initial provision at which they would forgo considering any contribution. The results are shown in figure 6.

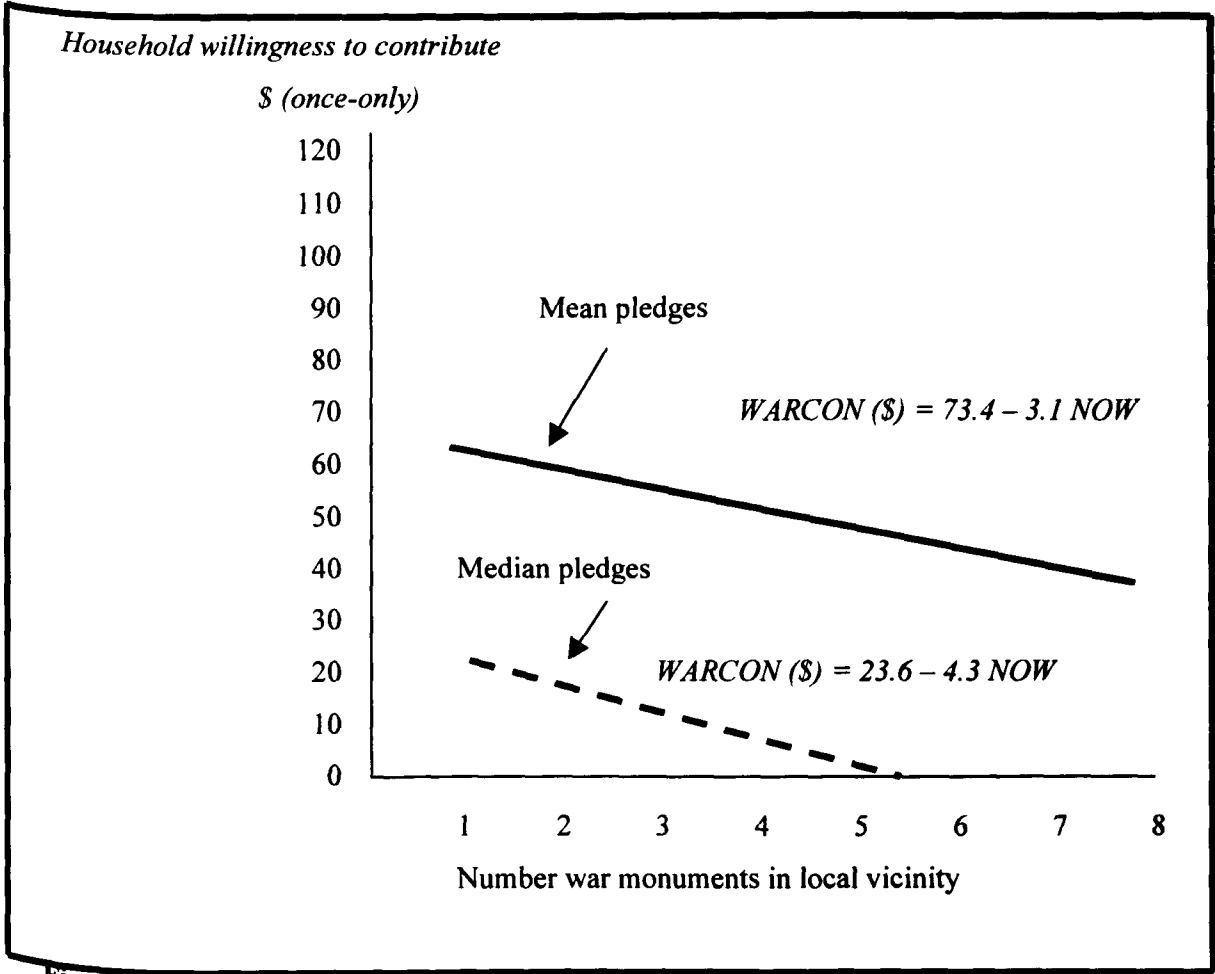


Figure 6. Jurors' willingness to contribute toward the retention of a war monument

The mean contribution level across all jurors of \$70.50 fell markedly to \$43.00 when there were two monuments present. Despite this, the rate of decline was not maintained, with a hypothetical 24 such monuments needing to be situated locally before the participants would reduce their pledged contributions to zero. By adopting the median pledges as a somewhat more

realistic assessment of the juror's intentions, the initial \$20.00 household contribution rate fell to just \$5.00 when a second memorial was near-by. The point at which the median bids were exhausted was at an initial provision level of between five and six units. This figure varied from 4 in Warren and Strathfield, to 6 in Dubbo, and up to 10 in Mudgee. Overall, the median assessments resulted in a much narrower band of findings between the locations than was the case with the mean bids.

This line of questions was followed by ones which again asked the jurors to act as value consultants on behalf of their community. In this case they were to nominate a once-only amount leviable on all households in the Municipality to assist with the retention of the subject monument (on the basis that the area had no other such structures). The mean figure nominated was \$44.40 (median \$10.00). Throughout the juries the figure ranged from \$0 to \$1000. To avoid the unintended influence of what appeared to be implausibly large bids such as the \$1000 figure, the median figures are considered more appropriate. On this basis, the bids varied from \$5.00 in Strathfield and Mudgee, to \$15.00 in Warren, and up to \$20.00 in Dubbo. If these figures were adopted, the total impost collectable through Council rates from each of the locations would be \$18 525 in Warren, \$253 540 in Dubbo, \$31 475 in Mudgee, and \$43 720 in Strathfield. On this basis Warren would have the least amount of financial resources available to fight the loss of the monument. At the other extreme, Dubbo's funds may be up to fourteen times larger than Warren's to undertake such a task.

When asked to consider the same question but on the basis that the levy would become a standing annual charge, the nominated amounts fell in line with the results for previous similar questions. In this case the overall mean reduced from \$44.40 to \$14.02, and the median fell likewise from \$10.00 to \$5.00. This rate of reduction is consistent with the earlier findings that people are willing to notionally capitalise around three years worth of annualised contributions in a once-only payment format. Re-stated, it confirms that annual contributions are only ever likely to represent around one-third of the amount people are willing to contribute if they expect that they will be requested to re-contribute in the foreseeable future.

An important implication of the measure of the juror's willingness to make annual (perpetual) contributions is that these amounts – when applied across the communities that the juries represent – provide an estimate of a notional annual cashflow that can be associated with the monuments. Also provided in the forgoing estimates is a notional net present value indicated by the compensable value due to the communities by the potential monument purchasers. By substituting these figures into the formula provided in Section 3.3.1 (repeated below) an estimate of the discount rate applicable to the public asset can be determined. In effect, it



represents the social discount rate. To ensure the broadest set of figures is used to derive the rate, the gross measures of each category are applied in the following calculation. The PMT is taken as the mean annual household contribution pledged by the 100 jurors (\$14.02) multiplied by the number of households represented in the four jury locations (28 951, as per Table 20). The NPV is the mean value estimated by the jurors as the amount payable by a developer to acquire the monument (\$14 000 000, as per Table 24). Perpetuity is assumed to be a figure of 100, but smaller (or larger) figures will also derive a similar approximation of the discount rate.

$$\begin{aligned}
 NPV &= \frac{\sum_i^n PMT}{(1 + i)^n} \\
 \$14\,000\,000 &= \frac{28951 (\$14.02) (100)}{(1 + i)^{100}} \\
 i &= 1.07\%
 \end{aligned}$$

In this case, the derived social discount rate is marginally over 1.0%. This is considerably less than the typical benchmark discount rate based on the long-term Government bond rate (currently around 6.00% per annum), and likely to be much more reflective of a public sentiment than a commercial one. It also appears to be commensurate with the theoretical expectations that a social discount rate for public goods with extended spatial and temporal characteristics should be some measure of magnitude lower than any concurrent commercial discount rates. Even if the more conservative median figures are adopted in the exercise (PMT = \$5.00, NPV = \$500 000), the discount rate remains well within the usual range of commercial discount rates at 3.4%.

As expected, a fall in the juror’s recommended once-only household contributions occurred when it was suggested that the district actually had two such monuments, and that the levy would be used to attempt to save both structures in their present positions. Under these circumstances, the mean estimates of per-household contributions fell from \$44.40 (\$10.00 median), to \$23.40 (\$5.00). It was apparent that most jurors found the thought of releasing a public feature such as the war monument to private ownership largely abhorrent regardless of the number of local equivalents.

Similar to previous WTA questions, the jurors were also asked in this section of the instrument to identify the amount of compensation they would expect to be paid to their individual households for the loss of the war monument. Once again, the majority of them failed to

register an answer to this question. Only 45 of the 100 jurors offered a figure in response to the question. The statements provided by the participants in the following free-form comments question expressed a similar set of sentiments to those expressed previously. Namely, that because the monument was not a private asset it was not the loss to the individual households that was important. Instead, it was the loss to the community that ultimately mattered, and quite obviously, this type of question was not likely to elicit the measure of that value.

#### 4.9.2 Value under conditions of alternative public benefit

The alternative scenario presented to the jurors concerned the hypothetical requirement for the monument site to be deployed for vital ambulance telecommunications equipment. Under these conditions, the structure's re-location was for purposes other than commercial benefit.

In contrast to the 88% negative response to the private developer scenario, only 29% of the jurors considered that the memorial should remain in its present position if it meant that the ambulance service had to find an alternative approach to meeting its needs. An analysis of the mean rate of response indicated no significant difference in the affirmation rates between the locations. The free-form commentary opportunity that followed generated a relatively strong response rate. Sixty-two participants provided comments, with over half of these being of the 'extended' and 'lengthy' nature. Typical statements confirmed that the change in purpose justified the monument's re-location on the basis that a social benefit was still accruing to the community.

The jurors were asked to identify the amount that the ambulance service should provide as compensation to the local community for loss of amenity as a result of the structure's removal. Despite the generally positive regard with which the ambulance service is held, those jurors who were adamant that the monument should not be moved regardless of the service's needs provided indications of payment magnitudes that resulted in a quite substantial mean community compensation figure in Dubbo (\$116 375). The estimates were smaller in the other locations, but nevertheless, still far from zero: Strathfield \$33 964, Mudgee \$5700, and Warren \$4502. The impact of the relatively high estimates provided by the minority of jurors who were averse to allowing the structure to be moved is evident in these figures. In contrast, if the median figures are adopted as the appropriate measure of the juries' intentions, then there would be no compensation payable because the figure was zero in each location.

Jurors were asked to indicate the measure of their household's willingness to contribute to a fund to assist with the costs of maintaining the monument in its present location. The funds

would be hypothetically dedicated to the ambulance service to be used to off-set the additional expense incurred in using an alternative means of providing for their communication requirements. Overall, the mean pledge was \$40.40 (median \$10.00), ranging from \$62.40 (\$15.00) in Dubbo, to \$46.90 (\$20.00) in Warren, \$37.10 (\$5.00) in Mudgee, and down to \$14.60 (\$0) in Strathfield. There was no clear correlation between the extent of the pledges and the juror's actual contribution rates for the previous 12-month period, indicating that people were prepared to donate in this case regardless of their personal history of contributing to public causes. There were also no significant correlations between the magnitude of the pledges and any of the socio-demographic characteristics, excluding location. It was evident in the responses that the Strathfield jurors were least enthusiastic toward such public contributions, with Dubbo acknowledging a very strong willingness.

When it was suggested to the juries that there were two similar monuments in the immediate vicinity and that only one was to be affected by the ambulance service's needs, their willingness to donate to save the primary structure diminished, but it did not disappear. The overall mean reduced from \$40.40 (median \$10.00) to \$32.15, with the median falling to zero. The average 20% reduction in mean pledges was generally consistent throughout the four locations. It is evident from the results that it was only the bids of a minority that was maintaining a relatively strong impression of the scale of public attachment to the monument under the ambulance service scenario. The resistance to a strong reduction in the mean bids is evidence of this. On a *median voter* basis, people were not supportive of charging the Service for the removal of the structure. To determine at what level of initial provision those resistant to assenting to the Service's site needs would finally capitulate, the jurors were asked to indicate how many war monuments would need to exist in the local vicinity before the one in question could be removed. The mean figure was five. Dubbo continued to show the greatest resistance by nominating 11 as its estimate. The others all fell in the range of 2-3.

The jurors were again asked to assume the role of a value consultant on behalf of their community. In this case they were required to nominate a once-only figure to be levied on all households to assist with paying for an alternate telecommunications approach so that the monument could remain untouched. Consistent with the results generated when the jurors had assumed this role previously, the overall figure (mean \$30.00, median \$5.00) was around 25% below the amount that the jurors were prepared to contribute personally. Again, it indicated that jurors are mindful that their personal level of financial capacity may not be reflective of the total community they represent. The \$30.00 figure fell to only \$14.00 (median \$1.00) when it was suggested to the participants that in fact there were two memorials in the vicinity, and that only one would be impacted by the ambulance service needs.

In general, there was much less aversion to the use of the site by the ambulance service than there was to the monument's removal for commercial gain. Although the outcome – removal and re-placement – was logically similar, it was also evident that the two purposes were not emotively equivalent. This was an impression also confirmed in the free-form comments that followed. While only 33 jurors provided a comment on this aspect of the trial exercise, the message of the majority was that the efforts of the ambulance service should not be impeded by a problem such as that of the monument re-location.

#### 4.10 The value of the Macquarie Marshes

The Macquarie Marshes scenario alternatives devised by Morrison, Bennett and Blamey (1998), were presented to each of the juries for their assessment (refer Section 3.1.1). The purpose was to derive an expression of the Marshes' public amenity by way of measuring the once-only financial commitment jurors were prepared to make to support each of the alternatives. The scenarios concentrated on a relatively narrow range of options for the area, but it was obvious in them that a strong element of trade-off between employment and environmental benefits was the primary focus. The results of the juries' assessments are shown in Table 25.

	Wetland area (km <sup>2</sup> )	Waterbird breeding intervals (years)	Endangered and protected species present	Irrigation-related employment (jobs)	Household WTP to achieve alternative scenario (\$)	Mean WTP by values juries (\$)	Median WTP by values juries (\$)
Current scenario	1000	4	12	4400	n/a	n/a	n/a
Scenario 1	1400	3	16	4400	48.75	42.98 <sup>ns</sup>	20.00
Scenario 2	1400	3	16	4300	34.04	24.56 <sup>ns</sup>	5.00
Scenario 3	1800	2	20	4400	102.62	61.81*	20.00
Scenario 4	1800	2	20	4250	73.19	24.35*	5.00

**Table 25.** *Alternative Macquarie Marshes scenarios and juror's WTP to assist with achieving them.*

(Based on the scenario alternatives proposed by Morrison, Bennett and Blamey 1998). (ns = no significant difference between the juries' result and that of Morrison, Bennett and Blamey. \* = significant difference,  $\alpha = 0.05$ , two-tailed)

The initial question put to the jurors referred to their individual level of familiarity with the Marshes region. Jurors scored their familiarity on a 0-5 scale. An analysis of variance of the results indicated that there was a very significant difference in the mean scores for each location.

Being located adjacent to the Marshes, the Warren score of 4.23 contrasted strongly with that of Strathfield at 1.04. Dubbo and Mudgee returned figures of 2.89 and 2.20, respectively. The trend was that the scores diminished in line with the juror's distance from the Marshes.

When asked if the Marsh area should be allowed to expand, implying that farming and employment rates may suffer, the result was largely indecisive. Fifty-four jurors voted 'no'. The other 46 were in favour of allowing the Marshes to expand despite the potential cost to jobs and local income. An analysis of variance indicated that the split sentiment was relatively consistent throughout the four juries. In Warren 67% of jurors voted against expansion, as did a similar proportion in Strathfield. The result was slightly more favourable to Marsh expansion in Dubbo (58% in favour) and Mudgee (56%). A correlation analysis confirmed that people with stronger environmental sympathies tended to vote in favour of the expansion ( $r = 0.231$ ). There were no other significant correlations with any of the juror's socio-demographic characteristics.

A mean WTP across all locations of \$42.98 was recorded for the first alternative scenario. This ranged from \$23.68 in Strathfield, to \$38.35 in Dubbo, \$38.36 in Mudgee, and up to \$72.92 in Warren. The level of these commitments ran approximately parallel with the strength of familiarity with the Marsh area. The medians followed a similar pattern, with Strathfield recording the lowest (\$10.00), then Dubbo and Mudgee (\$20.00), and Warren (\$50.00), with the overall figure being \$20.00.. A t-test of the mean results tended to validate the findings of the Morrison, Bennett and Blamey study concerning the quantum of people's willingness to contribute to achieve a change from the current scenario to the first alternative option. By extrapolating the result over the total population represented by the juries (28 951 households in the four locations), the value of the hypothetical improvements resulting from the implementation of this option is around \$1 240 000.

Scenario 2 was a repeat of the first with the exception that it resulted in the loss of 100 local jobs. Although each of the juries expressed a willingness to fund this option, the overall mean level of personal commitment fell by 43% from \$42.98 to \$24.56. Re-stated, it indicates that almost half the value of the theoretical environmental improvement is eroded if the 100 jobs are lost as a result of the changes. It also implied that *ceteris paribus*, the value of the jobs that would be hypothetically lost in the region is approximately \$533 000, or \$5 330 per position. An analysis of variance confirmed a significant difference in the responses to this scenario based on location. While the Warren mean pledge was \$50.42, the others all fell in the range of only \$15.20-17.46. The overall median also declined from \$20.00 to only \$5.00. Similar to the first scenario, there was no significant correlation between the quantum of the pledged amount and any of the socio-demographic characteristics. A t-test of the jurors' mean pledged figure and the

amount recorded for this same scenario in the Morrison, Bennett and Blamey study indicated there was no significant difference in the figures.

Scenario three was, quite obviously, the most favourable to all concerned. It maximised the environmental benefits without any negative employment impacts. Morrison, Bennett and Blamey found that people were willing to commit \$102.62 on average to achieve such an outcome. In the case of the values juries, this figure reached only \$61.81 (median \$20.00). Despite this, it still represented an increase of 44% on the first scenario. It differed from that initial scenario only in its greater environmental pay-off. Extrapolating this increased mean pledge over the household population represented by the jury members results in a notional value of \$545 000 being associated with the net environmental benefits that differentiate scenarios one and three. Once again, the bids tended to vary considerably, with Warren recording \$115.00 (median \$65.00), Dubbo \$57.08 (\$40.00), Mudgee \$45.56 (\$20.00), and Strathfield \$31.92 (\$15.00). An analysis of variance confirmed the significant difference between locations. Apart from the correlation between location and the pledged amounts, there were no other significant associations between the participant's responses and any of their socio-demographic characteristics. In the case of this scenario, a t-test confirmed a significant difference between the mean pledges of the juries and those participants in the Morrison, Bennett and Blamey study.

The final scenario was similar to that of the previous one in its environmental benefits. The exception was in its suggestion that an employment decline of 150 positions was also a likely outcome. In this case the mean pledge declined by 60% from \$61.81 (median \$20.00) to \$24.35 (\$5.00). These figures varied from \$40.83 (median \$5.00) in Warren, to \$21.96 (\$7.50) in Dubbo, \$20.44 (\$3.00) in Mudgee, and down to \$14.92 (5.00) in Strathfield. By extrapolating the mean figure over the population of households represented by the jurors, the decline in value associated with the loss of the 150 jobs is \$1 085 000, or \$7 230 per position. This is a rate that is not dissimilar to the 100-job differential between scenarios one and two. A correlation analysis confirmed that, once again, no significant association exists between the magnitude of bids in response to scenario four and the juror's socio-demographic characteristics. In other words, there is no particular trend evident in the intensities of commitment toward the various scenario alternatives based on any of the background characteristics, except, where indicated, location. A t-test of the mean juror pledges for this scenario against those recorded by Morrison, Bennett and Blamey confirms a very significant difference in the overall figures. As is the case with the previous scenario, the jury members bid considerably less than the those who had been previously canvassed.

While significant differences in the jurors’ mean pledges were evident between locations, differences between medians were not so pronounced. They tended to cluster in smaller ranges than the mean figures and possibly provide the more precise indication of what the ‘average’ participant would bid.

Regression analysis of the impact of the other three scenarios on any one of the mean overall scenario pledges confirms a very high level of predictability in the figures. An consistent  $r^2$  of around 0.8 was evident for the jury data, implying that around 80% of the variance in the mean pledges for any one of the scenarios can be explained by reference to the scale of bid on the other three scenarios. The regression equations are:

$$\begin{aligned}
 PLEDGE_1(\$) &= 3.87 + 0.27PLEDGE_2 + 0.54 PLEDGE_3 - 0.03 PLEDGE_4 \\
 PLEDGE_2(\$) &= -8.09 + 0.19 PLEDGE_1 + 0.13 PLEDGE_3 + 0.67PLEDGE_4 \\
 PLEDGE_3(\$) &= 10.76 + 0.98 PLEDGE_1 + 0.34 PLEDGE_2 + 0.02PLEDGE_4 \\
 PLEDGE_4(\$) &= 7.02 - 0.02 PLEDGE_1 + 0.73 PLEDGE_2 + 0.01 PLEDGE_3
 \end{aligned}$$

Where  $PLEDGE_n$  is the overall mean pledge for each scenario (in the sequence indicated in table 25).

The question framing provided by Morrison, Bennett and Blamey is such that the various environmental and employment factors are suitable for transformation into the following algebraic form, based on the mean overall pledges:

<i>(Current scenario)</i>	$1000 AREA + 4 BIRDYRS + 12 SPECIES + 4400 JOBS$	$=$	$\$0$
<i>(Scenario 1)</i>	$1400 AREA + 3 BIRDYRS + 16 SPECIES + 4400 JOBS$	$=$	$\$42.98$
<i>(Scenario 2)</i>	$1400 AREA + 3 BIRDYRS + 16 SPECIES + 4300 JOBS$	$=$	$\$24.56$
<i>(Scenario 3)</i>	$1800 AREA + 2 BIRDYRS + 20 SPECIES + 4400 JOBS$	$=$	$\$61.81$
<i>(Scenario 4)</i>	$1800 AREA + 2 BIRDYRS + 20 SPECIES + 4250 JOBS$	$=$	$\$24.35$

Where  $AREA$  is the Marsh area ( $km^2$ ),  $BIRDYRS$  is the waterbird breeding interval (years),  $SPECIES$  is the number of endangered and protected species, and  $JOBS$  is the number of irrigation-related jobs. The \$-amounts represent the mean pledged figures for the total membership of all juries.

Solving for the unknown factors provides an estimate of the amount by which each of them impacts on the mean pledged figures. In this case  $a = -135$ ,  $b = -689$ ,  $c = -250$ , and  $d = 1074$ . The figures firstly imply that in the absence of any employment benefits in the scenarios, the juror's mean bids would all be negative (nil). In addition, by holding waterbird breeding events and threatened species stable at 4 and 12, respectively, the area of the Marshes would have to expand by a factor of around 7 to off-set the loss of all of the 4400 employment positions. Re-stated, *ceteris paribus*, each job is worth around  $1.6\text{km}^2$  of wetlands as far as the broader community is concerned. Alternatively, in the absence of any other environmental improvements, the 4400 jobs are worth approximately 2 waterbird breeding years. This is the actual hypothetical case in scenarios 3 and 4, but due to the presence of the two other environmental benefits (increase in both wetland area and threatened species numbers) included in these constructions the singular effect of the breeding cycle tends to be masked. Similarly, if all other factors are held constant, the 4400 jobs are equivalent to approximately 40 threatened species. In other words, if the wetland area remained at  $1000\text{km}^2$  and waterbird breeding proceeded only every 4 years, as per the current scenario, then the broader community would (theoretically) accept the loss of the 4400 jobs on the basis that the number of threatened species present in the Marsh area rose from the current level of 12 to at least around 40.

The final question in this section of the instrument was a free-form commentary. Forty-five jurors responded. It was one of the few sets of commentary where the remarks were generally shared between the pro-employment and pro-environment participants. Overall, there was no correlation between the strength of commentary and the side that they supported. Typical statements suggested that the Marshes were important from an environmental perspective but that they should forgo their status when people's livelihoods are at risk. Others suggested that the Marshes should claim priority regardless of the employment consequences.

Up to this point in the values jury exercises the jurors were provided with only minimal information about the Marshes or any substantial detail about their ecological significance. As a consequence, all of the assessments were based on the disparate, unshared, personal knowledge of the individual jurors. Following an extended presentation by two expert advocates on behalf of both sides of the environment/irrigation debate, the jurors were re-presented with the four scenarios to determine if the information was consequential in altering their intensities of preference. The results are presented in section 4.13 of this thesis.



#### 4.10.1 An alternative Macquarie Marshes value scenario

As an alternative means of validating the jurors' assessments of value in the trade-off between employment and environmental benefits, jurors were advised that hypothetical scenario 4 was the actual current position and then asked to indicate their willingness to allow the situation to alter to that of the 'current scenario', as per Morrison, Bennett and Blamey's options. Scenario 4 holds that the area of the Marshes is 1800 km<sup>2</sup>, waterbird breeding occurs every second year on average, 20 endangered and protected species are present in the region, and 4250 people receive an employment benefit as a result of irrigation-related activities. As (per the 'current scenario') a direct result of dedicating more stream flows to irrigation, the foreseeable benefit is an increase in jobs to 4400 positions. But the cost of this is the potential for the wetland area to reduce to 1000km<sup>2</sup>, waterbird breeding to reduce to every fourth year, and the number of endangered and protected species to fall to 12. The jurors were asked to indicate whether they considered that this was a fair trade-off, or whether additional public compensation was necessary.

Of the 100 jurors, 43 expressed the opinion that no further compensation was necessary. An analysis of variance confirmed that the rate of affirmation was relatively consistent throughout all of the locations. When correlated with each of the socio-demographic criterion, including their environmental orientation, there was found to be only one significant association, that being with gender. Somewhat surprisingly, many of those people who had expressed a sympathetic bias toward the environment earlier in the jury exercise tended to forgo that inclination when presented with this employment-improving scenario. It appears that in cases where the benefit can be recorded in terms of relatively short temporal spans and local spatial limits, people may be prepared to reconsider their broader personal principles and commitments. The correlation with gender indicated that males were more likely to accept that jobs were a sufficient pay-off for the loss of environmental benefits.

When asked to identify the amount of compensation due to the people of New South Wales in return for allowing the Marshes to be affected by the additional demands of the irrigation industry, the mean figure of \$26 million provided by the jurors tended to mask the 'average' assessment. In each location a substantial mean figure was nominated: Warren \$9 million, \$12 million in Dubbo, \$70 million in Mudgee, and \$16 million in Strathfield. Despite this, the impact of the outlier bids was very evident when the medians were taken into account. On the basis of the medians, Warren and Strathfield actually recorded bids of zero, implying that, as far as the median voter in each of these two juries was concerned, the employment trade-off represented a satisfactory form of compensation to the broader community. Even in Dubbo and

Mudgee, the median bids for compensation in addition to the employment benefits was substantially lower than the mean figures, at only \$1.5 million and \$200 000, respectively.

When asked for their comments on the issue, 46 of the jurors offered their opinions. The responses were mixed, with many of the statements favouring the irrigators ('Why should they be given a hard time when they are trying to make a dollar for themselves?'). Despite this, the trend was toward more passionate comments being delivered by those unmoved by the employment benefit argument. For example, 'Any monies collected then should go directly back into our natural environment via the community, or to support/retrain people that (*sic*) would consider destroying our environment for the sake of a job'.

#### **4.11 Willingness to compromise**

The potential for people to act strategically, with an aversion to compromise, is a factor of any form of negotiation. Throughout the jury trials the participants were asked to provide their assessments of value based on a single WTP pledge or WTA payment for each of the hypothetical constructions. Some indication of the presence of a strategic attitude in the minds of the jurors was demonstrated via the iterative process of re-stating questions in a variety of ways. Incongruous bidding by the participants was – in the absence of any inconsistency in the question framing – an indication of the existence of an attempt at behaving strategically. In a trial setting where the questions being addressed are hypothetical, the problem of such behaviour is compounded by the lack of a substantial methodology to verify the intensity portrayed in the bids. To establish if any strategic bias may have been present in the minds of the jurors when answering the various value-based questions, they were asked to consider whether, as an overall measure, they would be willing to compromise on their bids, and if so, then by how much?

Forty of the jurors indicated that they would not be generally willing to compromise on the amounts of their bids. The other 60 confirmed that their true expressions of value were probably somewhat less than initially indicated. Although the willingness to consider compromising was relatively consistent throughout the Warren, Mudgee and Strathfield juries, in Dubbo 24 (92%) indicated that they were willing to consider reducing their bids. Apart from this very significant association between location and willingness to compromise there was no correlation with any of the other juror socio-demographic characteristics. The disproportionately high Dubbo figure may explain, for example, why the \$70 million public compensation payment assessed by that jury was so far above the \$9-16 million range identified by the others in response to the question concerning the Macquarie Marshes in the previous section.

When asked to identify the measure of their willingness to compromise, Dubbo offered the highest figure of 8.5%. That is, they would be willing to reduce their bids by an average of 8.5% and still feel satisfied that they had arrived at a satisfactory outcome. This was followed by Strathfield (5.4%), Warren (4.2%), and Mudgee (3.2%). Again, it appears that the Dubbo jurors may have adopted a more strategic attitude when considering their responses to the issues being addressed. There were no significant correlations between the measures of compromise and any of the socio-demographic characteristics, indicating that no particular sub-group was more prone to such behaviour. By excluding the jurors who indicated no propensity to compromise, it became clear that the overall willingness to do so was much more consistent than initially indicated. For example, by filtering out the 'no compromise' jurors in Warren, the mean willingness to compromise of those who indicated an affirmative attitude to negotiate, was 8.3%. By adopting this process it is evident that a much higher, and more consistent, willingness to compromise was present in the juries. In fact, on this basis, the figure for Warren was similar to each of the other locations: Dubbo 9.2%, Mudgee 8.0%, and Strathfield 9.6%. The figures indicate that, in general, people who *are* willing to negotiate, may be prepared to do so by as much as 10% without feeling as though they had capitulated on their personal principles or values.

When asked for their comments on the issue of negotiating to a satisfactory compromise, only eleven jurors offered any opinion. Most of these were relatively brief, with the majority reflective of the broad ideal that '...humans in general need to re-evaluate the worth of our environment'.

#### 4.12 *Consumer versus citizen modes*

Following the suggestion offered by Sagoff (1988), there appears to be considerable support in the public value literature for the existence of a dual modality in people's reasoning about important social issues. Sagoff's legacy is the creation of the concept that people operate at various times as *citizens* and at other times simply as *consumers*. An implication is that if people acting in their normal consumer roles are given insight into a significant topic, they are then likely to consider it from an alternative perspective, namely, as a concerned citizen. The test for this may typically involve pre- and post-information assessments of the intensity of people's concerns about the particular topic. This view of modes of thinking may in fact be somewhat patronising given that people are usually also endowed with some capacity to differentiate trivial issues from important ones based on their own prior knowledge.

When the jurors were introduced to the values jury concept, they were given no further instructions than to act on their own behalf and, when instructed, to assume the role of value consultant on behalf of their local community for particular assessments. Whether they acted as *consumers* or *citizens* in these exercises was a factor of their own reflections, and not a role directed by the operation of the jury process. From the impressions provided by the jurors during the trials, there appears to be a strong likelihood that the majority of them may have automatically adopted an archetypal citizen role without being prompted to do so. To test for the presence of such a citizen mentality Section 14 of the questionnaire asked the jurors to deliberately assume a citizen mode of thinking. To encourage this, they were presented with a modified version of Sagoff's definitions of the two fundamental operative roles (consumer and citizen), and requested to re-consider several of the topics that had already been presented to them. This was undertaken to determine if their assessments may have altered subject to the new role they were adopting. A paired-samples t-test was used to determine if the means varied, and a Wilcoxon signed ranks test was applied to the medians. The results are shown in Table 26. To limit the possibility of participants returning to their previous answers for verification of their *citizen*-related ones, none of the relevant questions was provided on the questionnaire. Instead, they were all delivered orally by the moderator. This was considered necessary to ensure that the two sets of responses were as independent as possible.

The results of the tests tend to confirm that there was no broad difference in the responses of the jurors between the separate applications of the questions. In other words, the juror's *citizen*-based responses did not vary substantially from those they had supplied earlier to the same set of questions. This was particularly evident in the mean responses, but some variation was evident in the medians. Where the medians differed from those derived previously, the trend was that the post-citizen ones tended to be considerably higher. Overall, the findings support the general conclusion that people were already acting in a *citizen* mode throughout the jury trial without any external enticement or coercion to do so.

One particularly unanticipated result emerged from the comparison of the two sets of responses. Although the overall means varied only marginally between the two, the coefficient of determination ( $r^2$ ) for each set of questions confirmed a relatively low predictive capacity of the first response set in terms of its influence on the second set of answers. The coefficients for the seven questions ranged from only 0.12 for question 31, up to 0.54 for question 30. This somewhat unexpected finding means that factors other than the juror's initial responses had played a significant role in determining the measure of their responses when the same questions were put to them again. In other words, despite the consistent overall response sets, the low level of predictability indicates that within the groups jurors actually provided relatively

inconsistent responses. Some increased their *citizen*-oriented bid amounts, while others decreased them. Despite this they ultimately all tended to vary marginally around a common central tendency for each of the specific questions, resulting in there being no significant difference evident in the means.

Question <i>How much would you ...</i>	Combined juries' response when initially asked		Combined juries' response when adopting a <i>citizen</i> mode	
	Mean (\$)	Median (\$)	Mean (\$)	Median (\$)
(Q. 25) ... be prepared to pay on a once-only basis to support a national environment fund ?	185.46	55.00	192.24 <sup>ns</sup>	50.00 <sup>ns</sup>
(Q. 26.) ... be prepared to pay on a continuing annual basis to support a national environment fund ?	48.90	20.00	54.38 <sup>ns</sup>	12.50 <sup>ns</sup>
(Q. 29) ... be prepared to pay on a once-only basis to assist with the purchase of an additional dialysis machine ?	52.57	20.00	65.82 <sup>ns</sup>	50.00*
(Q. 30) ... be prepared to pay on a continuing annual basis to assist with the purchase of an additional dialysis machine ?	18.05	10.00	15.76 <sup>ns</sup>	10.00 <sup>ns</sup>
(Q. 31) ... recommend Local Council levy every household on a once-only basis to purchase an additional dialysis machine?	34.19	10.00	30.60 <sup>ns</sup>	20.00*
(Q. 32) ... recommend Local Council levy every household on a continuing annual basis to purchase an additional dialysis machine ?	11.56	5.00	10.14 <sup>ns</sup>	5.00 <sup>ns</sup>
(Q. 44) ... expect Local Council to charge as a premium to off-set the loss of a historic building ?	71.45(%)	12.50(%)	94.57(%) <sup>ns</sup>	31.50(%)*

**Table 26.** Comparison of combined juror answers to questions on a pre- and post-*'citizen'* mode basis.

(ns = no significant difference between the two means or medians, \* = significant difference,  $\alpha = 0.05$ , two-tailed)

Within Section 14 of the questionnaire, the jurors were also provided with two opportunities to provide free-form comments. The first was following the questions concerning donations to the national environmental fund. Only 20 jurors made any comments, with most being relatively

brief. The idea that pro-actively assisting in the support of community ideals may pay personal dividends appeared as a common theme: ‘We should always try and help the local community as we never know when we may need help’. To many people, it is evident that this may most appropriately define just what being a citizen is all about. The response rate to the second commentary option was even less, with only 14 jurors offering any remarks. This opportunity to comment followed the questions concerning the dialysis machine and the historic building. Those who provided a statement tended to consider that there should be no difference in people’s responses to citizen-based questioning as the ‘principal (*sic*) should be the same’.

#### **4.13 The post-debate value of the Macquarie Marshes**

One of the primary objectives of the values jury trials was to determine if the provision of detailed information about a specific public topic was influential in altering the juror’s perceptions of the fundamental aspects of the particular issue. In this case the topic addressed was the employment-*versus*-environment trade-off in the Macquarie Valley, with the impact on the Marshes used as an indicator set. In a previous section of the questionnaire, the participants had already been asked to reveal various assessments of their Marshes’ value-orientation (see section 4.10). By subjecting the jurors to a repeat of these questions on a post-information basis, the initial set of responses could then be used as a control against which a measure of the impact of the debate was made possible. In each location the debate was conducted over a period of several hours, with expert advocates employed to deliver the case for the defence of both perspectives. The same advocates were contracted to present their cases in each location to ensure a relatively uniform and consistent set of arguments was presented to the juries. The presenters relied on a range of media to deliver their addresses, and moderator-controlled dialogue between the speakers was permitted as a means of revealing any contentious aspects of the cases being presented. Dialogue both within the audience, and between the jurors and the advocates, was encouraged at various times throughout the presentations. At the completion of the debate, the jurors were requested to reconsider their assessments of the various hypothetical Marshes alternative futures. In the following section they were also asked to consider their opinions on the alternative ‘current scenario’ position. Once again, to limit the possibility of participants simply reverting to their previous answer sets for reference points, the questions were all delivered orally with only answer spaces provided on the actual instrument. The response sets appear in Table 27.

The initial question asked of the participants was whether the Marsh area should be allowed to expend even if it cost jobs. In the pre-information responses, the overall vote was 54-46 in favour of the employment benefits. On this basis, a median voter or majority-based decision

would have opted for retention of the *status quo* for the Marshes. Following the debate the decision would have been reversed, with the jurors voting 45-55 in preference of allowing Marsh expansion despite its potential detrimental impacts on employment in the Valley. The largest single swing in voter preference occurred in Strathfield where 16% of the jurors were swayed by the pro-Marsh arguments. The Warren vote remained unchanged. In Mudgee the swing was also in favour of the Marshes by 12%, but in Dubbo the jurors were not so convinced, and actually voted in favour of allowing employment to take precedence with a swing of 8%.

	<i>Pre-debate responses (\$)</i>		<i>Post-debate responses (\$)</i>	
	Mean	Median	Mean	Median
<i>Current scenario</i>	n/a	n/a	n/a	N/a
<i>Scenario 1</i>	42.98	20.00	74.98*	20.00 <sup>ns</sup>
<i>Scenario 2</i>	24.56	5.00	51.69*	10.00*
<i>Scenario 3</i>	61.81	20.00	90.27*	45.00*
<i>Scenario 4</i>	24.53	5.00	45.43*	10.00*

**Table 27.** Comparison of Macquarie Marshes pre- and post-debate response sets.  
(ns = no significant difference in the mean/median responses. \* = significant difference evident,  $\alpha = 0.05$ , two-tailed)

An trend evident in the post-debate response sets is that a consistent and significant alteration in juror sentiment had occurred. The results generally indicate that the jurors *were* influenced by the presentations made to them, with the pro-environment case gaining the greater share of converts. The extent of the impact is most simply identified in the overall average 77% increase in mean pledges. A similar increase was evident in the median responses. The greatest rate of increase occurred in Strathfield, followed by Warren. This may suggest that those most remote from the centre of the debate, and therefore least directly affected on a temporal or spatial scale, may be the most fickle in their commitments to such an issue. On this basis, lobbyists providing information to distant – albeit, influential – audiences may find this to be an efficient means of promoting their side of the public cause. This also implies that such an audience may be least well equipped to deny the claims of the advocates, particularly if the counter argument is not provided to them. It also appears most likely that the Warren participants felt they had a great deal to gain from a resolution of the irrigation debate, and so their bids tended to increase markedly. Despite the substantial increase in the average Warren bids, none of the jurors actually changed their personal stance on the employment-*versus*-environment topic. The water allocation issue has focussed on Warren more than any other location in the Macquarie Valley, and the township has been subject to considerable environmental scrutiny. An amicable

compromise would take the public pressure away from the locality and it appears that the jurors may be prepared to assist in financing any such resolution process regardless of their personal environmental preferences.

Consistent with the coefficients of determination in the previous section, an anticipated strong predictive capacity of the Marshes' post-debate responses from the bids provided in the pre-debate figures was not unequivocally evident. Although relatively reliable as predictors, the 0.2-0.5 range of  $r^2$  figures suggested that a large number of the jurors had changed their bids, but most of the predictive capacity associated with estimating by how much, lay outside of the level of the initial pre-debate figures. In other words, although the overall bids had tended to shift upwards, there was a considerable inconsistency in *who* changed their bids, and by what amount.

When asked to provide their comments on this section of the trial process, 30 jurors responded. Most made brief remarks, and these tended to support the arguments of the pro-environmental advocate. Some suggested that she had 'won' the debate. Others hinted that their budget constraint was the limiting factor discouraging them from making even higher bids: 'If my income was larger, the above amounts would be larger. Preservation of our planet is of utmost importance to me'. Importantly, several jurors responded that they felt the debate was conducted in an even-handed way with the advocates both well acquainted with the topic.

#### 4.13.1 The post-debate alternative Macquarie Marshes value scenario

Following the presentation of the Marshes' debate, the jurors were also re-presented with the alternative 'current scenario' to determine if their sentiment toward the hypothetical threats to it had altered. This alternative starting point suggested that the Marsh area was around 1800km<sup>2</sup>, waterbird breeding was proceeding on a two-year average cycle, 20 threatened species were present in the area, and there were 4250 irrigation-related jobs in the region. The threat was that this may alter to 1000km<sup>2</sup>, 4 years, 12 species, and employment increase to 4400 positions, respectively.

The jurors were asked to indicate if they felt that the increase in employment was a fair off-setting benefit against the environmental losses. When the question was asked earlier in the jury exercise the response from throughout the trial locations was 43-57 against the need for some form of additional compensation to the broader community. On a post-debate basis, the result varied slightly but not enough to alter a median voter or majority verdict decision. On the second application of the question the vote was 47-53 against further compensation, with an



average of only one participant per jury electing to change their stance on this subject. A follow-on question required the jurors to nominate the amount they expected to be paid as compensation to the broader community by the irrigation direct beneficiaries. In line with the intent demonstrated in the previous question, the median vote was 'nil' in both Warren and Mudgee, rising to only \$100 000 in Strathfield, and \$1.75 million in Dubbo. A Wilcoxon test confirmed no significant difference in the overall responses of the jurors between the two applications of the question. Despite this, due to the presence of several extremely large - but minority-based - estimations of the measure of compensation expected, the mean response figures for this question remained high. A paired-samples t-test confirmed that there was no significant difference between the means of the bid amounts in this case and those generated when the same question was put to the jurors previously. The conclusion from such results is that people may be willing to pledge a personal donation to support an apparently worthwhile environmental cause, but they are reluctant to demand compensation or attempt to limit people's employment prospects in the process.

A final opportunity to comment was provided at the end of this section of the questionnaire. Thirty-six participants accepted the option of making a statement in this case. Several of them hinted at the reason for avoiding a demand for public compensation. For example, 'once compensation is paid for any reason, where does it stop?' But perhaps the reluctance of most jurors to seek a payment is appropriately summarised as a means of demonstrating a spirit of compromise: 'Both sides must work together to resolve the problems associated with these water issues'.

#### **4.14 A final rejoinder on the VJ process**

The principle objective of the VJ model is to provide a forum for the sharing of information and the assessment of stakeholder values in a manageable, inclusive setting. As a means of revealing whether the participants felt satisfied with the process, they were asked a series of questions on an *ex-post* basis relating to the operation of the trials. The majority of the impressions are recorded earlier in this chapter. One of these assessment questions was deferred until the end of this section of the thesis. It was the final question in the instrument, and asked the jurors to report (on a 0-5 scale) as to what extent the Macquarie Valley water allocation issue had changed in its personal significance to each of the participants. The question was framed to indicate if the jurors had been the beneficiaries of a significant learning experience as a result of their involvement. The mean response was a relatively high figure of 4.45, with no significant variation between the different juries. On this basis, each of the juries appeared to be recording a strong vote in favour of the efficacy of the learning component of the values jury process.

## DISCUSSION

### 5.1 Personal values and public sentiment

The study and measure of personal values is central to the interests of many fields of human research. From philosophy to anthropology, and from sociology to psychology and economics, it is the expression of values that dominates the search for meaning in people's actions, beliefs and attitudes. As Braithwaite and Scott (1991 p661) point out,

‘Values are presumed to encapsulate the aspirations of individuals and societies: they pertain to what is desirable, to deeply engrained standards that determine future directions and justify past actions.’

Arising from this is a challenge relevant to many disciplines, namely: the development a form of assessment that satisfactorily measures the intensity of commitment that people have to a particular set of values. It is one of the core objectives of many types of anthropocentric research that has never been satisfactorily resolved. And beyond this, the refinement of a widely-accepted mode of aggregating those values to indicate the preference orientation of a collective group of individuals, still remains a major challenge. This is especially so in those fields of inquiry that rely on monetary values as a basis for measuring and comparing inter-personal preference intensity.

The central problem is that for values to be considered when decisions affecting a group of individuals are to be made, those values must be adequately identified, measured, aggregated, and then communicated to the relevant authority. But the institutional process will invariably influence the nature and content of the individual – and therefore the aggregated – expressions. Consider, for example, three such value-eliciting processes: participating in a market, responding to a public opinion survey, and voting in a democratic election. The market provides an expression of values as revealed by actual behaviour. Opinion surveys tend to construct a hypothetical scenario, often also incorporating a hypothetical market. Both of these modes of expression assume that the individual will act in a way consistent with neoclassical economic theory, and that therefore the outcome is a reflection of rational processes on behalf of each individual. Conversely, voting procedures often constrain the individual's choice set and may only permit a 'yes' or 'no' response to what may be a complicated issue. In the case of all three modes of expression, participants are only able to identify their values within the limitations of the institutional process. So, for example, people with inadequate resources are effectively excluded from registering their values when the institutional process for indicating preference

intensity is the market. The result is that the full range of values is often left unidentified, causing misallocation, misuse, and, quite often exhaustion of the resource in question (Prior 1998). The limitations of many of the existing forums for the identification of values has led to widespread mistrust of assessment methods, particularly economic ones. It has also resulted in a lack of support from policy-makers for value-identifying techniques such as contingent valuation. Despite this, the general hegemony of CV continues to prevail. The problem is at least partially associated with the dearth of new and more appropriate models of values elicitation. These issues demand that more sensitive procedures for the expression of people's values are developed.

In recent years the relatively raw expressions of values achieved with the aid of basic neoclassical economic procedures - incorporating willingness-to-pay and willingness-to-accept concepts - have begun to be supplemented by demands for more ethical, inclusive, discourse-based approaches. The typical argument for such a broadening of approaches centres on a need to identify the values actually held by the impacted public, rather than just the opinions of 'experts' employed to act as advocates on behalf of one or other factional interests. To do this involves commitment from authorities to recognise the rights of people to participate in information-gathering processes, for input into public decision-making. It therefore relies on an underlying demand for democratisation of public decision-making processes. It is this call for inclusiveness that grew out of the rights-based movements initiated in the 1960's. Opening any public debate to consideration of the legitimate claims of the impacted parties often involves identifying uncertainties and risks. But by making these explicit it is not only the values of those affected by any public decision that are identified, it is also the values of those who adjudicate on the decision that are revealed. Removing the decision process from behind any form of institutional veil also exposes the authorities to the scrutiny of their constituency. By including the diverse voices of the 'moral community' affected by a public decision goes some way in shifting the focus of the process away from the potentially vested interests of an influential few and toward the recognition of the legitimate claims of those who often remain unheard.

In recent years there has been a growing interest in the potential of a number of fresh approaches to the problem of measuring the intensity of people's values. Several novel deliberative models have emerged that are gaining respect across a range of disciplines. These include citizens' advisory committees, citizens' panels, and citizens' juries. It is precisely because of their relative novelty that each of these models is yet to develop a substantial protocol for application, and for this reason they are being trialed in a variety of ways including, for example, in so-called 'consensus conferences' in Australia (Neimeyer 2000). The most highly publicised such

conference to date in this country was the one convened in 1998 to consider the issue of whether – and in what form – the people of the Australia would decide on the question of becoming a republic.

The reason for the upsurge in interest in such methods of deliberation appears to relate to a growing distrust of ‘expertise’. Although these new approaches are yet to be fully tested across a wide range of applications, as of now their relative infancy provides an opportunity for thorough investigation of their efficacy before they become too subject to what sometimes proves to be debilitating criticism. Whether fairly applied or not, such criticism can lead to a form of cynicism that may ultimately erode into a further distrust. Sometimes it seems that it may simply be the shock of the novel that alarms the establishment. Already it is quite elemental to claim that the deliberative models will lead to ‘soft’ approaches to ‘hard’ public issues because participants are likely to lack a strong degree of expertise. But the counter-claim is that ‘experts’ lack the local affinity needed to truly represent the values held by those impacted by the decisions being scrutinised. The fact is that any new approach to recognising the interests of those affected by public policies and processes also has the potential to raise its own concerns. It is precisely for this reason that novel approaches to the democratisation of public decision-making need to be tested.

One inherent limitation of the various citizen-based models of public consultation is that most produce an outcome that is based on some form of polling amongst the participants. The forum may, for example, lead to a vote to allow a development to proceed, or one to modify some existing publicly-impacting activity. In either case the intensity of the collective will is registered by the number of votes in favour of a particular outcome. By varying the basis upon which the forum’s collective decision is to be identified, the panel’s verdict may also be altered. For instance, a vote reliant on the rule of unanimity may be less likely to produce a particular outcome as would the same vote held on some form of majority-rule basis. In the extreme it may be the vote of the uninterested majority that overrules the interests of the intensely passionate minority. It would therefore seem appropriate that the relative intensities with which people ‘vote’ should also be incorporated into the forum’s verdict. As yet no model has been developed to capture such measures. The values jury is the first to attempt to do so.

#### 5.1.1 Research approach to the values jury process

The guiding principle in the approach taken here to trialing the values jury process has been the traditional hypothetico-deductive model. It is foremost a positivist approach that fits neatly within the percepts of analytical philosophy and relies heavily on empiricist methodology.

Alternative approaches – less reliant on an analytic tradition – including phenomenology, classical pragmatism or existentialism are of limited applicability to a quasi-experiment such as that undertaken in this thesis. These alternate approaches may be more appropriate to foundational-type studies where pre-existing empirical knowledge is limited. Conversely, where a considerable amount of *a priori* knowledge exists then it is generally appropriate for it to be accepted as a ‘given’ and relied on for the development of consequential synthetic propositions. Such an approach is common - and, in fact, extremely convenient – for application to any research employing models of economic and statistical analysis.

In general, the empiricist approach that draws on probability analysis and hypothesis testing for its verification procedures incorporates a relatively tidy filtering process. Test results that reveal the actual degree of probability or lead to the acceptance or rejection of a hypothesis provide an analysis that is convenient, though not necessarily without dispute. The question that belies these measures is whether they provide a *satisfactory* explanation. In the research approach adopted in this thesis the rather limited set of direct measures available with which to assess the effectiveness of the VJ process was acknowledged. As a consequence, a model of analysis refined from Welder’s interpretation of Habermas’s work was constructed. The subsequent questions put to the jurors as well as the scoring and interpretative system, are all relatively novel and unique to this thesis. These were not the only aspects of the research that were unique. The local features about which jury members were asked to indicate their intensity of attachment – via WTP and WTA bids – are unlikely to have ever been used as the objects of consideration for the measurement of such intensities previously. Similarly, the specific socio-demographic characteristics referred to extensively throughout the data assessment process for correlational analysis were selected from an almost infinite range of parameters. The limitations implied by these constrained sets of analyses and characteristics is acknowledged. Perhaps, as the overriding limiting factor, the research budget limitation should be identified as the single most influential factor in the process. Overall, the jury trials – incorporating the pre-trial testing – cost approximately \$16 000. The majority of this was applied to juror attendance payments, but a significant proportion was also used to fund professional fees of the expert advocates, pay for venues, and to cater for items such as postage and printing. On a pragmatic basis it is the budget that most obviously constrained the research approach. But within the bounds of this budget constraint other – more theoretical - criticisms of the VJ research approach must also be acknowledged. These may be most appropriately summarised by two sets of arguments, namely, post-empiricism and realism.

The typical post-empiricist critique (Hollis 1996) of a research approach such as that adopted in the values jury trials is that the analysis and interpretation offered is inadequate, not because it

failed to reveal hidden evidence but because it may have done so in a less than comprehensive way. The analysis may have benefited from an even greater web of correlations to provide a greater predictive power for a larger set of cases. Post-empiricist arguments do not necessarily advocate an overthrow of empiricism. On the contrary, they tend to promote the need for enhanced application of standard empiricist models for the benefit of precision. There is a consequence implied in this approach though, in that it may lead to a complexity that encourages confounding and mis-interpretation. In the case of the VJ trials, constraints imposed by the availability of both funding and secondary information (such as Australian Bureau of Statistics data) were the primary limiting factors in determining the extent to which the research could proceed. Other limitations included time, locational and administrative factors. It is within this matrix of limitations that the jury trials were conducted. An increase in the flexibility of any one of these factors may have enabled a greater set of trials and observations to occur resulting in a larger data set from which to draw interpretative analysis. Notwithstanding the limitations imposed by this set of conditions, the trials are presented in this thesis as a set of instances from which others may find inspiration to extend the jury process and the subsequent degree of empiricism.

The other argument – realism – raises questions concerning the level at which interpretive analysis is applied. Is it appropriate, for example, to consider explanations of phenomena from the psychological (individual) or from the social level, or possibly both? The individualist case has traditionally depended on the interpretation of conscious or unconscious motives inherent in human nature, and on the account of how these may generate social organisation and interplay. The social case – sometimes termed ‘holist’ – tends to rely on a much more mechanical set of analogies. It uses system analysis, avoiding or limiting reference to the actions of the individual elements. It recognises the universe, for instance, as a system that requires objective measurement rather than as a series of sub-systems which together form a giant system. Similarly, in neo-classical economic analysis, realism tends to question whether the correct interpretation of the interaction of economic processes is more appropriately described from the perspective of the individual participant or from that of the system within which she participates. In the case of the values jury trials – subject to the constrained set of conditions within which the research was executed – a holist approach has generally been adopted. In this study, analysis and interpretation at the level of the individual is avoided and instead revelation of trends at a higher level of aggregation are the primary objective. So, for example, groupings based on location, employment status and level of post-school education are relied upon rather than case studies of individuals. This has avoided the need to conjecture on the difficult issues surrounding individual motivation. In many ways it is also reflective of the level at which collective decision-making occurs in public institutions. Public authorities – both by custom

and by design – tend to consider the needs of their constituents from a collective view. It is often the case that individual preferences are subordinated to the interests of the group. Anyone who has had their dwelling disturbed in the cause of streamlining traffic flows will appreciate this point. Likewise, it is at this level that cost-benefit analyses traditionally proceed. If the VJ model is to be considered as a potential aid to such processes then it is almost obligatory for its analysis to be framed in the holist approach. It is this approach that has been adopted in this thesis, but it is also acknowledged that a deeper penetration of the responses of the individual participants may also prove fruitful to future VJ researchers.

### 5.1.2 Measurement of individual values

The contentious philosophical issues raised by the ‘realist’ approach to research are a particularly apt introduction to the problems associated with the measurement of people’s preferences. Whether derived by revealed preference (RP), stated preference (SP) or collective choice methodology, ultimately the cumulative preferences of any particular group of people are generally believed to represent the aggregate desires of the individuals who constitute the group. Both RP and SP methods are examples of behaviourism. Revealed preference is indicative of actual behaviour, while stated preference is reflective of intended behaviour. Behaviourism is not unique to economics, and in fact was widely supported in other fields of academic endeavour including linguistics and psychology. It was initially imported into economic analysis by Samuelson (1938) at the height of the behaviourist movement in American psychology. During the 1950’s it lost credibility in many of these other fields of research but not so in economics. In fact it was gratefully absorbed into economic theory at a time when the definition of value (in the economic sense) was being refined within a broad framework of logic. It was not surprising then that behaviourism found itself injected into the applied fields of value research, and in particular, contingent valuation. Davis’ (1963) work is widely acknowledged as the first attempts to apply behaviourism to the assessment of public preference intensity in the absence of objective market evidence. This seminal work on CV methodology has, within a relatively brief time frame, led to a massive expansion in CV applications. The work of the NOAA panel and judicial sanctioning (in the United States) of protocols for the use of CV has also aided its absorption into mainstream economic assessment. In the other social sciences, behaviourism was abandoned because of the recognition that it was practically impossible to determine just what the inner motivating factors were to produce a particular behaviour. It was also considered absurd to use observation of activities or preferences as the sole source of knowledge. Despite this, economics has clung to behaviourism as a basis for estimating value. On this basis it is not surprising that so many (including micro-economic) economic forecasts are subject to error.

In many ways it is unfortunate that CV has been granted a degree of respectability despite its relative infancy. As a tool of preference measurement it has considerable intuitive appeal particularly where assessment of non-use (axiologic) values is concerned. Its fundamental limitation though is that there is little evidence that it actually measures what it claims to measure. The extensive list of potential biases associated with its application provides evidence of this. As an example, if scope bias is evident in a CV survey (that is, if respondents confuse the value of a single item with that of a number of the same items) then the aggregation of such a confounded result will place the ultimate value estimate in error by a factor of several times rather than just by a modest margin of percentage. The relative haste with which CV has been absorbed into standard economic theory in the US has not been repeated in other countries including Australia. Here, public authorities have been reticent to condone any form of SP technique including CV for reasons that are reflected in misgivings about behaviourism and doubts about validity. Revealed preference techniques have received more favourable treatment. When RP's are identifiable they are subject to much less conjecture because they are recognised as reflecting a market sentiment. Despite this, behaviourist interpretations of market activities are prone to fanciful interpretations and often reveal the entrenched philosophical orientation of the interpreter rather than providing a meaningful assessment of the motives of the market participants.

While economic assessment of non-market values continues to contend with issues of behaviourism and bias, the other inherent constraint to aggregating individual preferences to arrive at a collective measure is reflected in Arrow's 'general possibility theorem' (Arrow 1951, 1963). Interpersonal comparison of preference in the absence of some objective measure is precluded by Arrow's theory. Most CV studies simply avoid this issue and assume that a dollar in one person's hand represents an equivalent measure in any other's hands. The issue of personal budget constraints and alignment of intensity of preference with measures of WTP together tend to place a limit on the validity of values revealed by traditional CV surveys. In the majority of such surveys the questions are framed in the context of revealing peoples willingness to pay, and, up to a point, this may be a practical means of assessing value. That 'point' being a figure that is well within the social contribution budget for each survey participant. Quite simply, if – as is the case with most CV's – that budget limitation is left unidentified, then there is a questionable benefit, in revealing a WTP that has no acknowledged potential limitation. In the haste to develop and apply the CV method it may simply be a matter of "wrong questions and misleading answers" (Knetsch 1994 p351). For this reason some advocates of CV agree with Arrow that ordinal measures of interpersonal values are of doubtful validity and instead they promote ordinal measurements (Mitchell and Carson 1989, Fisher



1996). These are most usually reflected in referendum-style questionnaires. Although it is clear that aggregating individual WTP measures is contrary to Arrow's theory, it is not altogether clear that the same applies to the aggregation of WTA measures. Under conditions where a personal budget constraint does not exist there is appeal in the notion that people will nominate a reliable figure that represents their actual degree of attachment to the goal in question. The typical criticism of this approach is that under these circumstances the bid will be exaggerated and incorporate a strategic bias. This may be the case but at least it dispenses with the limitation of the personal budget constraint that precludes valid comparison of the intensity of interpersonal measures. CV research is yet to fully contend with these issues and so authorities in many countries have quite appropriately avoided recognising the method as a reliable source of data for inclusion in cost-benefit analysis. In the meantime those, for example, who act as advocates for the protection of public goals tend to find little solace in CBA's that mis-represent the measure of values lost when a significant environmental feature meets with its demise due to the incapacity of the analysis to identify those particular values.

This thesis has been critical of traditional applications of CV methodology, but in the absence of a more widely respected and reliable model for assessment of public preference intensity, has had to base such measures on that methodology. It was not within the scope of the VJ project to attempt a re-construction of the CV technique. Instead, the application of the technique has been altered to incorporate a variety of measures including personal WTP, personal WTA, and collective WTA. The latter is a variation that has received negligible coverage in the literature, and yet it may hold potential as the fairest measure of value particularly where public goals are concerned. Asking a collective WTA value places the respondent in the role of a group representative or 'value consultant'. The fundamental problem with asking people to act as value consultants on behalf of a constituency to determine the measure of compensable loss is that such a process does not fit comfortably within traditional economic logic. That logic holds that the collective value of a good is reflected in the aggregated values of the individuals who suffer the loss of its utility. To ask instead, what a person acting on behalf of a group of people considers is the value of the loss to that group, contradicts the behaviourist approach to the revelation of value. But, as has been argued, it is not altogether clear that the behaviourist approach is valid when applied to economic analysis. On this basis there is no reason to believe that a valuation derived from a 'value consultant' is any less valid than one derived from traditional CV approaches.

## 5.2 Efficacy of the values jury process.

The values jury is a model of deliberative discourse that is specifically focussed on the assessment of preference intensities using economic metrics as the measurement tool. It relies on the analogy that a small, well-informed group of people can provide a meaningful analysis of what may be a complex issue, in much the same way that a judicial jury is expected to derive its verdict. In many respects it can do what a typical jury can do – vote for or against an issue – but by incorporating a measure of preference, the intensity of commitment is also revealed. The principal objective of this thesis is to report on the efficiency of the VJ process as identified by the series of trials conducted throughout New South Wales.

One of the most important reasons for selecting the Habermas-Webler theory for assessment of the VJ process is the evidence it gives to individual autonomy. The civil rights movement of the 1960's spawned an upsurge in institutions that sought to lift the veil of indifference that many political authorities had held toward their constituents. This elitist approach had been the dominant political paradigm in a vast majority of Westernised nations. It heavily influenced people like Schumpeter (1942, 1954) who saw that public decisions were the domain of political elites, with the populace only called upon to determine which of the competing elites were to govern. The identifiable shift in perception that arose from the 1960's movements favoured a much more egalitarian view of public decision-making inspired by the normative claim that each citizen should be able to co-determine political decisions that effect his or her livelihood. The result has been an upsurge in social institutions that fit anywhere between the two extremes of elitism and egalitarianism.

This shift away from the hegemony of elitist institutional practices has favoured the rise of public participation. In participatory democratic theory, public involvement is considered to be morally and functionally integral (Rosenbaum 1978). Writing at the height of the unrest of the 1960's Bachrach (1967 p3) claimed that the ability of democracy to function was to be measured by the soundness of the decisions reached in light of the needs of the community and the scope of participation in reaching them. The effect of the Habermas-Webler approach is that, in the tradition of critical theory, it promotes the normative concept that people ought to have an autonomy that allows them to enter into social relations which respect their rights as individuals. The key, according to Habermas is critical self-reflection. Once people are free to consider their social needs they will tend to think about the society that they want. Public participation should, according to Habermas, be the means to demonstrate that critical awareness. On this basis public participation is to be guided by shared societal values about what type of society participants would like to have. The central element in this is that, to at

least some extent, people already hold these values. The challenge then becomes one of providing the social institutions for revelation of these values, followed closely by the need for critical examination of the efficiency of these institutions. The Habermas-Webler model of discourse assessment represents an attempt to meet the needs for identifying how fair and competently any social institution operates. In this instance, the institution in question is the VJ model of public participation.

#### 5.2.1 Fairness and Competence.

It would be naïve to believe that any participatory process could be fair to everyone's interests. However, if it is open and the rules are clear and consistent, much of the mystery can be eliminated. It would also be impractical to believe that any one model should always produce the best decision. In this context the VJ model is one of many that may provide authorities with a reliable means of identifying both the direction and intensity of social preferences.

The deliberative nature of the values jury process emphasises rational discourse. In practice, people may participate with no intention of providing a realistic reflection of their position. They may want to use the opportunity as a stage to make claims about issues far removed from those in question or they may simply seek some strategic privilege in the discourse process. Any deliberative technique is prone to abuse simply because of its inherent nature; it encourages people to share their views. The more enlightened participants are likely to recognise that to achieve a practical outcome strategic positioning is best left aside in favour of co-operation (Webler and Renn 1995).

The *ex-post* assessment of the VJ process by the participants provided a strong vote in favour of the model. Much of the negotiation about agenda-setting and rule enforcement had to be dispensed with simply because of the research-based nature of the trials. On a practical level this did not appear to diminish participants responsiveness to the process. If implemented as a model for the resolution of a particular public issue, authorities may find it time-efficient to present the participants with a flexible set of guidelines for agenda-setting and rule enforcement rather than re-negotiate them for each application of the model.

Although one of the most common arguments in favour of public participation is that all citizens should have an equal chance to influence decisions, whenever the model for participation used to reveal the views of the citizenry is selective in its attendance pattern, it is debatable as to how much public concern is actually being revealed. In many ways the various novel models of public involvement which incorporate the presence and views of only a representative sample of a community, necessarily exclude the views of the vast majority. Unfortunately, unless the broader public is subject to an extensive process of informative debate followed by a general

referendum of their preferences, it will tend to remain impractical for public authorities to seek out the views of all who are potentially impacted by a particular public policy decision (Dietz1995). On this basis, cost-effective, pluralistic, discourse-based models of selective public participation are likely to be favoured by authorities over those that only manage to seek out the views of a less-than-well informed public or of entrenched vested interests.

The fact that many who advocate public participation are also sceptical about how fair and competent such processes are in practice has arisen from widespread negative experiences associated with such institutions as public hearings. A common perception is that citizens' interests are not necessarily taken seriously because authorities are more interested in taking the path of least resistance to achieve their desired ends (Udehn 1996). People can readily feel that authorities regard them as unwanted intruders in the decision-making process. Implied in this is a sense that it is not necessarily the quality of the participation model that is of primary importance to authorities, rather, it is the authorities' sincerity in inviting people to become involved in the process (Coote and Leneghan 1997). Whether any particular model of public participation is applied in a fair and competent way is in so many ways ultimately dependent on the commissioning authorities' goodwill and encouragement toward the model. The VJ model has a particular advantage over other small-group focussed ones in that it seeks to reveal intensities as well as raw preferences. In practice this may count for little if participation is considered as a paternalistic means of placating the constituency.

Encouragement of a spirit of co-operative effort in the application of the values jury model – or any of the kindred techniques - is vital to the success of the exercise. Providing participants with the feeling that the process has been fair and competent in revealing the measure of their public preferences is important in ensuring that their enthusiasm to participate is not diminished. To enable this, authorities should recognise that institutional hurdles may inhibit the 'best practice' application of such a model. These blocks may include the issues of conflicting rationalities, distrust, insufficient knowledge, and a sense that participation is merely a form of public therapy (Renn, Webler and Wiedemann 1995b).

Conflicting rationalities are most evident when the basis for public management decisions is cost-benefit analysis where the impacted public feel that the measure of their interests has not been satisfactorily taken into account. This typically leads to accusations that public decision-making is technocratic, while at the same time expert's lament about public 'irrationality' (Adams 1993). The flow-on to a level of distrust between the parties is an obvious outcome. Distrust coupled with a sceptical view of the ability of citizens to evaluate what may be complex issues often means that authorities remain uninformed about the preferences of the concerned public (Checkoway 1981). But authorities who then attempt to overcome such problems by

offering models of participation intended to act as a form of public therapy should be mindful that in the longer-term such a policy may only entrench a mutual distrust (Blalock 1989).

Inviting the public to participate in any decision-making process is not necessarily a silver bullet. Ensuring that fair and competent means of incorporating the public's views is a vital part of the flow. Ultimately, all of the parties to a decision may agree that a tolerable level of impact represents a satisfactory compromise in a public project despite their being pre-existing concerns about the magnitude of that impact. To ensure that the most satisfactory outcome is reached, a systematic procedure for revealing the values and preferences of the impacted parties is necessary. The values jury is one possible model for discovering the measure of those critical factors.

#### 5.2.2. The values jury: a protocol.

There is no ideal process that satisfactorily synthesises the competing legitimate demands for public participation, and technical and economic rationality, while assuring accountability and responsibility of decision-making authorities. Evaluation of a model that attempts to deal with an important component of this milieu provides no surety that the other parts will function successfully. The values jury represents only a step within this larger process. There are, in fact, many layers in a fully functional public-focussed decision-making system that incorporates the input of many parties including interest groups, experts, citizens and sponsors. Even before a public authority elects to employ a values jury for a specific purpose it should have completed at least two earlier steps.

Firstly, the authority should have noted the broad concerns of its constituency, mindful that these may vary subject to the criteria used to assess the credibility of those concerns. Secondly, it should have considered the options available to arrive at the preferred model of public participation. Electing to proceed with a values jury simply because it is novel may, in the end, do more harm if it is not an appropriate vehicle for the discovery of the information sought. The performance of alternative models is possibly most appropriately assessed by some form of independent expert panel. If they, in consultation with the interested shareholders, recommend a values jury as the appropriate model to proceed with, then it is at this point that a protocol may need to be referred to for implementation of the jury.

#### *Matters for consideration by a values jury.*

While juries may be called upon to consider an almost infinite range of topics, 'local' issues are preferable. Practical resource constraint including time and budgets may limit the capacity of

juries to adequately review matters with which they are not already at least nominally acquainted.

#### *Location of the jury sittings*

Local issues will usually dictate that sittings are held in the vicinity of the impacted constituency. This may also encourage sponsors to transport jury members to the site(s) in question for enhanced appreciation and familiarity. Where the impacts are distributed over a wide geographic area, the matter may necessitate the formation of a number of juries, each one chartered to represent the interests of its particular community.

#### *The jury questionnaire.*

To ensure that jurors participate as fully as possible in the process it is probably beneficial to provide the participants only with answer sheets. The questions may be delivered either orally – by an independent moderator – or separately and singularly for example, by way of overhead projection. This avoids the temptation for jurors to outpace the rate of delivery of information. Answer-only sheets should also act to discourage participants from continually reviewing their previous answers.

#### *Valuation question format.*

The jury may be presented with either form of the typical value question: WTP or WTA. Sponsors should also be mindful that participants may have the capacity to alter their perceptions of value subject to the roles they are asked to play. On this basis asking them to act as ‘citizens’ or ‘value consultants’ may lead to responses that vary considerably from their purely ‘personal’ ones.

#### *Reliability and validity.*

High levels of ability are usually implied when a consistent result is achieved for each re-application of a questionnaire. But where contentious social issues are concerned, ‘reliable’ responses may be difficult to achieve particularly if the situation is fluid resulting in a potentially ever-evolving set of responses. The more important issue is one of establishing validity. CV has established a relatively poor record for itself on this matter. Many of the issues that beset typical CV surveys may be overcome by the appropriate use of discourse involving clarification of issues and meanings. This is a potential advantage of the values jury over broad-scale CV studies. Despite this, there are many biases that may invalidate VJ responses and sponsors should be mindful of their presence in a jury questionnaire.

### *Jury size.*

Jury size represents a compromise between pluralism and practicality. Ultimately, the pragmatic considerations of time and budget limitations may be the overriding constraints on jury size. A jury may be of any manageable size. In the judicial system this has customarily been reduced to around 12 throughout most countries that continue to use juries. From a statistical perspective, citizens may be concerned as to whether such a small number of constituents can adequately express the cross-sectional interests of a broader community. Juries of around 25 have a greater capacity to reflect those interests without being so large in number as to become unmanageable. Any jury composed of less than this number may open itself to sample size criticism.

### *Jury selection.*

Self-selected jurors are most likely to represent entrenched vested interests or pursue strategic behaviour. To overcome this, a jury list is preferable from which participants are invited to attend. Ensuring that the jury membership adequately reflects the characteristics of the broader community implies that a database containing a selection of each potential juror's socio-demographic details is required. This may be difficult to achieve in practice and authorities may have to act with sensitivity when approaching this aspect of the jury selection process. Random selection from a source such as the electoral roll is one method of dealing with this issue but given the modest response rate to invitations (possibly as low as 10-15%), the sponsor may find that a fair community cross-section is difficult to achieve using this approach. In particular, the invitation is prone to a disproportionately high positive response rate from those currently not in the work force.

### *Juror attendance payments.*

Although a values jury may hold significant novelty value for a proportion of the attendees, it is clear that some incentive payment is necessary to encourage a representative sample of community members to attend. In particular, to ensure that those who might be otherwise employed have adequate incentive to attend, a pay schedule that broadly reflects the *pro-rata* wage forgone may be necessary. Obviously, despite offering payments many people may still be unable to attend due to compelling work commitments. Administering the jury trial on a weekend may overcome some of this problem.

### *The decision rule.*

Where the jury process is centered on a referendum-style format a variety of decision rules exists including unanimity, majority, special majority, and consensus. Sponsors should be clear as to their preferred mode of reaching a verdict prior to calling for the jurors' vote. Where,

instead (or possibly, in addition) a magnitude of value is sought, the decision rule will tend to focus on a mathematical central tendency. This may be the mean or the median. Typically, the mean may be up to several times larger than the median. In practice, the mean is the most appropriate measure of value. Multiplying the mean by the population size will arrive at the true total value. The argument against this is that the scale of the mean may appear to be exaggerated by the influence of outliers. But in the population from which the jury sample is drawn outliers *do* exist. For example, there are those whose contributions to social causes far exceed the typical payments of most willing donors. If alternatively, the decision concerns the impost to be applied on all constituents within a specific community then the median result may be subject to less contention, and easier to defend and administer.

#### *Constituency.*

It is worthwhile informing jurors of their specific role from commencement of the jury proceedings to ensure that the potential for confusion is minimised. If the jury has been commissioned to represent a particular community then identifying this to them is likely to assist in their appreciation of the significance of their role. Defining the constituency in temporal as well as geographic terms may be an advantage particularly if the 'community' has an epistemic basis. Such is the case for a community of say, scientists or health workers. There appears to be limited benefit in requiring the participants to act as 'citizens'. The results of this research indicate that people probably assume this role as soon as they are advised of the significance of the jury and its objectives.

#### *Information.*

Sharing knowledge and encouraging discourse is a central feature of the VJ model. Information involves a process of analysis, conjecture, clarification, and acceptance (or rejection). The discursive focus of the VJ model should encourage a strong information flow both from presenters to participants, and also between participants. The centralised nature of the process, which generally requires all jurors to be present simultaneously, should encourage presenters to be innovative in their communication style.

#### *Discursive criteria.*

Providing participants with an *ex-post* opportunity to reflect on the jury process proved to be a practical way to obtain feedback on the process. The Habermas-Webler discourse criteria, based on ensuring fairness of competency, appear to work satisfactorily as a template for revealing the participants' sentiments. Possibly, just as important, providing expert witnesses and other speakers with a copy of the discourse assessment criteria prior to their presentation is a useful tool to ensure that they attempt fair and competent delivery of their communication.



### 5.3 Ethical discourse and the valuation of public goods

The rise in stature of deliberate models of public participation has been as a direct response to the perceived inadequacies of the traditional approaches that have favoured techniques such as broad-scale surveys and referenda. These newer models – including citizens' juries and citizen advisory panels – tend to dispense with any attempt to reveal the preferences of each member of a community, and instead, concentrate on the views of a representative element within it. The broad-scale models suffer from an imprecision that may actually work against the preferences of the constituency. Take, for example, the Australian constitutional referendum held in late 1999 which generated a result that entrenched the position of the British Monarch as Head of State. Outside of the referendum, smaller-scale opinion polls tended to confirm that a strong majority of Australians desired independence from the Monarchy. The nature of the question put to the vote excluded any mention of this as a choice that could actually be made by the voters. Instead, it was implied within a specific model of governance that the people generally rejected. On this basis it could be argued that the process was unethical. Advocates of smaller-scale, localised, deliberative models of consultation have been mindful of the limitations and manipulative potential of participatory processes such as national elections and referenda. Their alternative models tend to emphasise the need for an ethical disposition by sponsoring authorities toward the collection of public opinions and preferences. Most often it implies the need for discourse between the concerned parties. O'Hara (1996) calls it discursive ethics. She defines it as a communicative process in which discourse participants share their concerns, expecting mutual acceptance and respect for their position. Implied in this is the notion that the knowledge of experts is a valid input into the process but no less valid are the claims to knowledge of those affected by the decisions to be made. O'Hara goes further to suggest that an ethical discourse perspective can be applied to environmental valuation processes. If this is the case then there is no obvious barrier to its extension into the wider realms of valuation associated with any form of public good. The values jury represents an applied model of the discursive ethic approach.

The traditional framework for revealing the magnitude of people's values has emphasised ideological (rights-based) approaches. These favour the hegemony of traditional utilitarianism and cost-benefit analysis, using broad-scale contingent valuation exercises as the usual basis for assigning values. It is possibly what is *overlooked* in this process that is most important. Such a rights-based approach is fundamentally anthropocentric, and typically relegates the duty-based aspects of the valuation process to a position of lesser – if not inconsequential - significance. For example, there is no guarantee in a contingent valuation survey that the sponsoring

organisation will be interested in the respondents' concerns about obligations to future generations, larger geographic publics, or the impacts of the decision to be made on distributive social justice issues. Question framing bias, interviewer bias, and selective interpretation of the results may ensure that the sponsor's preferred outcomes are achieved regardless of the supposed goodwill demonstrated toward the public by the commissioning authority. The advocates of discursive ethics can therefore claim that crises in public issues – including, for example, environmental issues – are fundamentally demonstrations of the weakness of existing democratic decision-making processes (Dryzek 1990, O'Hara 1996 p97). They argue for a re-construction of valuation processes that more appropriately reveal the deeper values that people hold toward aspects of their social milieu. Such a re-construction requires a complete re-assessment of the conceptual framework that underpins the commonly-accepted standard models of value revelation.

Despite its serious flaws, contingent valuation remains the preferred technique used by economists to establish value in the absence of other, more objective data. Reliance on such a criticised model is widely implored in the literature but even the critics realise that there is no obvious respectable alternative. It is perhaps the rise of a deliberative, discursive approach to valuation that holds the most promise. But such an approach implies 'messiness' compared to the more streamlined one of traditional contingent valuation.

'While it may not be easy for all of us to cope with the messiness of an open discursive valuation process, the messiness is where the power lies. It is the democratisation of a valuation and policy process which not only integrates research and context, but offers the inclusion of numerous, vastly different and potentially conflicting life worlds' (O'Hara 1996 p102).

An ethical discursive valuation process must therefore go beyond the expert to include the diverse voices of those impacted by the valuation process, particularly those who may have been so often unheard. This is not to dispense with the contributions of those with expertise, but rather it is to ensure that the contributions of empathetic, local, experiential knowledge and preferences of those affected by the valuation outcome is respected in the process. The values jury represents an attempt at absorbing these needs and re-assessing the contextual basis for revealing private values toward local public goods. This thesis has not attempted a radical re-construction of contingent valuation methodology. Instead, the practical and theoretical limits of CV are acknowledged and it will be the efforts of other researchers that will devise the next phase of the evolution of CV methodology. Here, the emphasis has been on integrating CV-type methodology into a discursive framework. The principle focus has been on the valuation of

aspects of the Macquarie Marshes as an example of a threatened public good. In pursuing this objective the opportunity was taken to also reveal the value orientation of participants toward other local public goods. Proponents of CV methodology may criticise such an approach because it represents a significant variation to standard accepted practice (promoted, for example, by the NOAA 1993). But, possibly more importantly, it represents an attempt at bridging the perceptible divide between such practice and the demands for a more inclusive, democratic approach to the estimation of values, particularly those of the impacted public.

### 5.3.1 Bias and the limits of hypothetical valuations.

A central issue in the acceptance of data provided by stated preference valuation studies concerns the matter of whether hypothetical bids are reflective of actual values. If not, then what do they represent?

Typical CV research accepts the deontological view that values akin to market values can be revealed by appropriately framing and delivering questions to respondents. Participants are presumed to act non-strategically and their answers are purported to portray their intensity of preference towards the good in question. For many CV advocates the principal concern is not what the resulting figures imply, it is how to calibrate them against real behaviour, that is, market behaviour (Boyce *et al.* 1992, Neill *et al.* 1994, Shogren *et al.* 1994, Schulze *et al.* 1996). This problem of hypothetical bias is one that has beset CV research from its earliest foundations. But this is probably minor when considered against the much larger issue of respondent intention. Regardless of the scale of a bid, it is not always clear that a CV survey has correctly identified just what it is that respondents *meant* when they offered a bid, or in fact what is meant when they offer no bid. The limits to discursive interaction typically constrain the information that respondents can provide to researchers. With few exceptions – notably, Brouwer *et al.* (1999) - evidence of post-survey contact between researchers and respondents on a face-to-face basis is lacking in the literature. This generally allows researchers to devise their own interpretation of meaning, which in many cases may lead to complete rejection of ‘unsatisfactory’ responses. This may in fact represent a rejection factor borne of researcher ignorance.

It was not the objective of this thesis to review the full range of biases, nor is it appropriate to offer a re-construction of CV theory. These issues are suitable for extensive research in their own right. Rather, there are observations emanating from the results of the values jury trials which may shed some light on several of the contentious issues facing the practice of contingent valuation research, including the issue of respondent intention.

#### 5.3.1.1 *Public-cause contribution limits.*

In a typical CV survey, respondents are asked to identify their willingness to pay for some public benefit. Although most of these surveys overlook people's actual budget constraint, they nevertheless tend to accept the nominated amount as a fair reflection of intent. Whether the bid amounts fall comfortably within the respondent's budget capacity is usually left unidentified. In the case of the jury members they confirmed a limit to their public cause contribution capacity. The jurors each willingly contributed a mean amount of \$418 (median \$250) to public causes in the 12 month period prior to participating in the exercise. If presented with further opportunities this figure may have peaked at \$632 (median \$400). On this basis, it would have been beyond the scope of the jurors' budgets to bid amounts exceeding this figure for any combination of hypothetical scenarios. It is relevant to note that the mean WTP pledges offered by the jurors to assist with just four of the hypothetical constructions amounted to a total of \$332 per household: environmental levy \$185, dialysis machine retention \$53, war memorial retention \$70, and Macquarie Marshes improvement (scenario 4) \$24. These four causes alone would have accounted for almost 80% of the juror's actual annual amount of public-cause contributions, and well over half of their maximum capacity to contribute to all such causes. Little would have remained to cover the continuous requests for contributions made to most people throughout any annual period.

The question then arises, are respondents to such questions prone to exaggeration as a form of strategic behaviour? In this regard the jurors' responses to the question that asked them to allocate \$1000 between six common public causes is relevant. When presented with the opportunity to contribute to the causes in any order of priority the sequence was health (23.2% of the total amount), followed by welfare (21.2%), education (20.4%), environment (17.1%), sport (9.2%), and religious causes (8.9%). The figures suggest a sentiment that places humanitarian needs highest in the order of priority. If these same proportions are applied to the mean peak contribution capacity (\$632) nominated by the jury participants then the maximum budget limitation for each type of cause is revealed. It is \$146 for health, \$134 welfare, \$130 education, \$108 environment, \$58 sport, and \$56 for religious causes. How relevant then is the jurors' nomination of \$185 as a mean rate of contribution to a national environmental fund, when their implied budget limit for *all* environmental causes is only \$108? (If alternatively, the median figures are employed, the environmental levy [\$55] still remains in advance of their maximum potential contribution [17.1% of \$250 = \$43]). It should be noted that the difference between the bid amounts for this issue and the implied budget constraint differs by a moderate – though not unreasonable – percentage, rather than by any multiple. On this basis, it is possible

to (approximately) equate the hypothetical environmental levy contribution with the participants' total environmental-cause budget capacity. In other words, it seems probable that in providing an estimate of their willingness to contribute to the environmental levy, they were, in effect, identifying their total annual budget limitation for such causes. And, quite possibly, in the absence of any other demand for this amount, fully allocating it to the first significant such cause. In a number of recent Australian CV studies it is clear that despite the variety of causes, a mean pledged figure of \$50-80 was common, particularly where the focus of the study was on an environmental issue (see, for example, Loomis, Lockwood and DeLacy 1993, Bennett, Blamey and Morrison 1997, Lockwood and Walpole 1999). Cummings (1989) takes a more cynical view and suggests that regardless of what is being valued, bids are almost always likely to fall in the range of \$10-60 (1989 rates). The consistency with which people are willing to nominate such amounts regardless of their prior affinity with the cause or its detail suggests that a latent willingness to contribute may exist which is held in reserve until presented with an opportunity to make a commitment.

The question that follows from this is how meaningful is the amount nominated in response to such a contribution request? If it simply represents a household total budget capacity for a particular genre of causes, how much of it is likely to be allocated to any particular example of such a cause? Champ *et al.* (1997) found that their CV research strategy resulted in a set of WTP bids that significantly exceeded people's actual willingness to contribute to the cause when they were pressed to convert their bid into a cash donation. As yet, very few CV surveys have recorded a successful conversion of bids into cash. It is the hypothetical nature of the survey that is targeted by most critics for this discrepancy. It may prove a great deal more beneficial if the bids are considered to be representations of a gross ethical commitment toward the general cause rather than as an actual reflection of the respondents' interest in the specific issue.

It is also possible to consider the issue from an insurance perspective. On this basis the total bid may in fact represent a premium payment for surety of survival of the feature in question. This perspective on the WTP issue is yet to receive any attention in the CV literature. What this view implies is that instead of each household being considered as 'valuing' the environment at a maximum of \$185, this amount may simply represent their willingness to contribute to an 'insurance' fund from which compensatory losses may be drawn. This would then make contributory bids analogous to a householder's willingness to make regular payments to an insurance provider for surety that if their dwelling was damaged an adequate compensation payment would be received. The value of the dwelling is many times greater than the insurance premium payment and therefore only vaguely reflected in the quantum of the premium. To

equate the measure of the value of the dwelling with the size of the premium may lead to large errors of estimation unless other pertinent factors are identified, including, for example, the relevant multiplying factors associated with the insurer's perceived risk.

Ultimately, it may continue to be a matter of conjecture as to how to properly identify the magnitude of people's intensity of commitment to a particular public cause. On the basis of the confusing evidence provided by advocates of CV methodology, it may prove beneficial for a stronger discourse-based approach to lead future research strategies. In the meantime – as the VJ study has identified – capturing estimates of willingness to pay bids without placing them in the context of total *ability* to pay will continue to act as at least one of the main deterrents to the broader acceptance of the figures generated by CV surveys.

#### 5.3.1.2 *WTP versus WTA.*

The usual framework for revealing values in a stated preference valuation exercise is based on the expression of people's willingness to pay or their willingness to accept. The mode of elicitation is typically by open-ended or closed-ended statements involving a single bid or an iterative series of bids. The most common format involves the determination of value by way of aggregation of individual WTP amounts. These are normally based on the responses received to the question "how much would you contribute to achieve...?" or "how much would you contribute to avoid...?". WTA questions concerning "how much would you accept as fair payment for the loss of...?" are much more infrequently employed than are the WTP type. The reason for the overwhelming reliance on WTP, rather than on WTA questions, is summed up in the NOAA (1993 p4605) statement that WTP measures provide a 'conservative choice'. Despite this, it is not altogether clear from the literature that expressions of WTP provide *any* guide as to the measure of values that people hold toward a particular public good.

As the VJ exercise revealed, the novelty of being asked such a question may lead people to express their total budget for all such contributions, in which case the bids may represent a gross exaggeration of the value of the specific good in question. This is a typical expression of embedding bias and scope bias. Conversely, if people are asked to reveal their WTP to avoid the loss, demise or destruction of a public good it is not always clear that this is the appropriate form of question. In the case of Ward and Duffield's (1992) scenic waterfall, people were asked their WTP to avoid the loss of the public good. The loss was based on the hypothetical scenario that the waterfall would make way for a commercial development. Under these circumstances it would seem inappropriate to ask the public for its expression of WTP: the good is already held in trust by a statutory authority on behalf of the public and an expression of WTA would seem

the correct measure. After all, it is the public who should be compensated for their proposed loss, they should not simply be asked for the WTP to avoid its loss as a form of ‘ransom’.

It is unfortunate in many ways that the NOAA recommendations have become the proxy standard by which most CV exercises are being regulated. Prior to the NOAA’s guidelines being released a healthy debate about WTP versus WTA is evident in the literature. The NOAA’s willingness to accept the ‘conservative choice’ argument can be traced back to Mitchell and Carson (1989). It was Mitchell and Carson who suggested that the discrepancy between the two measures is best resolved by considering the analogy of a payment that a condominium owner makes to have the common area of their building maintained in good order and condition. Despite enjoying the benefits of ownership, she must still be willing to pay to retain the building in a satisfactory state. It appears that this argument was readily accepted by the NOAA panel. While on the face it may seem an appropriate analogy to support the hegemony of the WTP strategy it is beset by one very basic flaw. This is the lack of acknowledgement of the fundamental difference between *planned demise* and *natural depreciation*. In the case of the condominium, payments would be made to avoid natural depreciation associated with the aging of carpets, paint, gardens and so on. On this basis owners may quite readily express a realistic measure of their WTP for the maintenance of the site. In fact, it is usually revealed by the owners in their willingness to enter into a contract of purchase that includes the provision of obligatory maintenance payments for common areas. This is vastly different from a payment incurred to avoid the planned demise of a public good. Asking people to pay for the retention of a collective good such as a waterfall is analogous to asking the condominium owners to pay to avoid the complete and deliberate destruction of their common area property. In many ways it may be satisfactory to ask what contribution people are willing to make to ensure that the waterfall is retained in good condition. But this expression of WTP is vastly different from the ‘ransom’ model. In effect, it is a model of value revelation that places the controlling interest in the hands of the acquirer rather than the owner. It assumes that the acquirer has natural rights to affect the demise despite the fact that he holds no pre-existing interest in the public good beyond that which all other parties hold. It is an area of ethics that draws the usually opposing views of teleology and deontology together. Regardless of whether the rights-based or duty-based perspective is taken, there is no ethical position that could support the question of WTP under these circumstances because in many ways, it represents a form of ransom payment. The more appropriate expression of value is naturally contained within the WTA question of ‘how much would you expect to receive to satisfactorily compensate for the planned demise of...(the waterfall, or the condominium common area, or any other collective good)?’. It appears that due to the respect accorded to Mitchell and Carson’s simple analogy it

may act as a compromising agent for stated preference methodological research for quite some time.

While the WTP versus WTA debate may have lost a considerable amount of momentum following the release of the NOAA's guidelines, there is another issue of concern sheltering within the WTA philosophy. Its identification may assist in re-positioning WTA as the appropriate measure for many stated preference studies that currently rely on the unsatisfactory WTP approach. It too is exemplified in Ward and Duffield's (1992) study. In their research on people's expression of values toward the waterfall they found that members of the impacted community were willing to accept a mean payment of \$22 each as a WTA compensation payment for the demise of the waterfall. There is an intuitive dissonance in both the nature and the magnitude of this payment. On what grounds could private individuals accept a payment for a good that has a public, collective nature? Surely, if a payment were to be made by an intending developer it should be made to the impacted community *in toto*, rather than as a series of individual payments.

This was an issue that also found expression in the findings of the values jury exercises. Although the series of open format 'comments' questions scattered throughout the VJ questionnaire instrument typically drew response rates of less than 100%, there was only one other question format that consistently produced a similar result. These were the questions that requested the jurors to nominate the amounts that they would personally accept as adequate compensatory payments for the loss of the various public goods referred to in the trials (questions 39, 47 and 60). There was obviously a category error involved in requesting participants to identify a private compensation value for a good over which they held no divisible right. The comments that followed each of these questions confirmed that it was difficult for people to conceive of a measure that could express such a collective loss in individual compensatory terms. It was not that a magnitude for the loss could not be expressed. In fact, jurors had expressed a quantum of *community-based* compensation payment in previous questions regarding the particular goods. Instead, the central issue concerned the privatisation of the public loss. On this basis Ward and Duffield's \$22 payment is incongruous and appears to be little more than a representative example of Knetsch's (1994 p351) 'wrong questions and misleading answers'. It is evident from results of the VJ trials that researchers should be mindful of generating questions inherently supporting the notion that any number is preferable to no number. Confounding private rights and duties with public ones in this way is only likely to generate more confusing and dissonant responses.



### 5.3.2 Vote-based limits.

The limits to jury vote-based verdicts was evident in the interpretation of the responses to the O.S. Simpson questions. Depending on the decision rule employed, Simpson would have been found guilty on a unanimous basis in only one location (Warren). In the others, his guilt would have been proven only if a special majority decision rule had been employed. Conversely, if the *median voter* approach had been implemented Simpson would have been declared guilty in each locality. These results highlight an important issue for deliberative models of public consultation: how should the united voice of the group be identified? A consequent issue particularly relevant to the values jury approach concerns the matter of how to appropriately identify the *intensity* of the group's choice. Although this may typically be represented by a form of central tendency measure is it to be the mean or the median?

Regardless of the decision rule to be employed, the (Habermas-Webler) guidelines for fair and competent discourse support the ideal of establishing all the procedural rules prior to undertaking the particular exercise. It is preferable that they are negotiated with the participants in a consultative process, but it may sometimes be prudent to dispense with this and allow the sponsors to instead pre-select a decision rule for ratification by the empanelled members. Researchers should be wary that this may open the process to abuse by commissioning authorities willing to select the minimum level of consent required to reach a particular verdict. In all cases, it is the median voter approach that will achieve this minimalist result. Conversely, adopting the unanimity rule allows every participant the right of veto and, depending on the topic of concern, this may produce unrepresentative – if not unethical – results. The concept of consensus decision-making is rather loosely referred to in many fields as an appropriate means of producing a verdict, it is also a vehicle that can, in the extreme, result in a dictatorial decision. Consensus relies on the concept that those who do not necessarily agree with a posited decision (yet who may also not necessarily oppose it), concede to the will of those whose preferences are more strongly in favour of it. The potential for strategic behaviour is self-evident in this approach. It may – if consensus is not possible – also result in split decisions that favour no particular outcome. While this may be just as informative to sponsoring authorities, it is also likely to lead to considerable uncertainty about the impacted community's preferred outcome. In the end it may simply entrench existing conflicts.

For most forms of consultative discourse models decision rule enforcement need not proceed beyond this point. But for a values jury a decision rule to clarify the single point – or possibly nominated range – of the quantum measure of the members' preferences is also required. If it is to be the median, jury members should be mindful that this figure appears to be consistently

significantly below that of the mean. If the purpose of the exercise is to determine the measure of say, a levy to be placed on all households within a community, then it is likely that adoption of this figure will prove to generate the least amount of public dissent. The median is a useful measure when the sample generates outlier bids that might be considered impractical or, in the extreme, implausible. But sponsors should also be aware that in all populations outliers – in the statistical sense – *do* exist. They are the ones that appear in the extreme decile or standard deviation ranges. And because they exist, their presence in a sample drawn from a particular population should not automatically be dismissed as unrepresentative. Statistical ‘massaging’ may assist in limiting their impact. This may include  $\alpha$ -trimming of sample results. Conversely, it may prove beneficial for researchers to report both the means and medians to enable the stakeholders to draw their own conclusions.

#### **5.4 Limits to the value of value estimates.**

One particularly crucial element of welfare economics impacts heavily on the applied field of cost-benefit analysis and its non-market value revelation tool of contingent valuation. It is the strong inherent acceptance that the preferences of the individual are a correct guide to her interests and therefore, welfare. This positive assumption underpins the normative judgement that society should therefore seek to maximise the satisfaction of those preferences. This standard neo-classical model of the utility-maximising individual may well have proved productive in many fields, but in the area of collective goods it has not been so appropriate insofar as it cannot readily absorb the incommensurate plural values that influence people’s preferences in such matters. The central theme of this argument is that some values are simply immeasurable using monetary valuations. The typical statement of the underlying need to employ estimates of values into CBA for example, is not simply that there are market imperfections due to issues such as externalities, but that there is no market at all for most public goods. The preferences of individuals may be sovereign, but there is no straightforward measure of them in such cases.

A range of methods has been employed to estimate the strength of people’s attachment to various classes of public goods. Some of these methods – for example, the travel-cost method – are regarded as being unsatisfactory because they measure only the ‘use-value’ that people derive from the goods. Since, by broad consent, this does not exhaust their value to individuals or the broader society, account need also be taken of the more esoteric axiological values attaching to the goods. In the absence of a more widely respected technique for elicitation, CV has been relied upon to provide the estimates of such values. The fact that the technique has been subject to much criticism suggests that the time is ripe for the emergence of an alternative

construction. Diamond and Hausman (1994 p63) perhaps typify the critics sentiment when they claim that ‘...CV is a deeply flawed methodology which does not estimate what its proponents claim to be estimating’. This is often reflected in the refusal of many CV respondents to attach monetary values to public goods at all. In other words, it often appears that respondents are indignant about placing values on collective goods in the same way as ordinary marketable goods. Such responses appear to reflect the fact that people are not merely concerned with their interests as private consumers but also with their interests as citizens in what is the correct policy for their society – or community – to adopt. O’Hara’s (1996) claim that the way forward is to promote a discursive ethic may hold considerable merit under these circumstances. The values jury deliberative model fits comfortably within O’Hara’s framework. Rather than reject the standard CV methodology in an attempt to trial some alternate valuation model, the VJ exercises sought to incorporate the concepts of the technique into the discursive setting. It will remain a point of conjecture as to what some of the resultant value estimates mean, but there appears to be a case to suggest that the evolution of the CV technique could be best encouraged by seeing it as a method that may be much more successfully employed as part of a deliberative process – such as the values jury – rather than as a stand-alone procedure.

#### 5.4.1 Jurors: *consumers* or *citizens*?

Most of the criticisms of public goods-related contingent valuations imply that response sets are generally meaningless attempts at measuring consumer preferences, heavily burdened with the biases inherent in such surveys. Others accept that responses to such questions *are* meaningful, but deny that they can be interpreted in terms of private valuations (Blamey, Common and Quiggin 1995). Instead, they argue that people take their valuation role seriously and provide their responses as citizens rather than as mere consumers. This is a line of reasoning promoted by Sagoff (1988) that has gained a broad following. In this, Sagoff sees citizen choices as separate from and ethically superior to consumer preferences. He assumes that choices such as voting decisions differ considerably from market-decisions and therefore involve public-oriented rather than private-benefiting motives. Empirical evidence to support such a view was found by Brennan, Quiggin and Shapiro (1991), who concluded that many people vote in public referenda for outcomes that are of little value to themselves on the basis that they are beneficial to society as a whole. A test to discern the presence of such a citizen-based functional attitude within the jury members was applied in relation to several of the public goods scenarios presented in the trials.

Overall, the answers nominated by the participants provided negligible evidence of a change in their approach to the specific topics following the moderator’s request for them to adopt – as far

as was individually possible – a ‘citizen’ mode of thinking. There are two alternative explanations for this. Either their *consumer* preferences were equal in intensity to their *citizen*-based ones, or, more likely, they had no need to alter their perceptions because they were already acting in a citizen-oriented role throughout the full proceedings of their particular trial. Support for strength of the latter argument is evident from the statements provided in the associated comments questions. The concept that the principles of value estimation should not alter when the topic concerns a serious threat to a collective good, was revealed in the commentaries.

It seems likely that all jurors in each trial were to a large extent aware that they were participating in a ‘significant’ research event from the commencement of proceedings. A quick view of the numbers in the room was probably adequate to inform them of this. On this basis – and without any conscious ‘coaching’ from the moderator – it is most probable that at no time did the jurors as a group revert to a *consumer* mode. Their willingness to consider all matters presented to them as *citizens* supports Sagoff’s assumption and tends to validate the perceptions that the participants adopted a strong ethical disposition throughout the proceedings.

#### 5.4.2 Asymmetric value functions.

Tversky and Kahneman (1981) proposed that people treat losses and gains asymmetrically, giving the former much heavier weight than a nominally equivalent latter. To test for the presence of such a function the jurors were exposed to two alternative scenarios that concerned a dialysis machine in their local hospital. According to their theory, Tversky and Kahneman would have expected the jurors to nominate a higher expression of values toward retention of the existing unit than toward the acquisition of an additional one. To the extent possible, it was made evident to the jurors that the purchase of the extra unit would provide the hospital with a capacity that just equaled the current capacity nominated in the alternate scenario. On this basis the alternate hypothetical constructions were (1) ‘existing capacity’ to be enhanced by the additional unit, and (2) the enhanced position to be eroded back to the ‘existing capacity’ by the loss of one of the dialysis units.

Despite the intuitive appeal of the logic, there was no evidence found to support the proposition that an asymmetric value function existed with regard to the dialysis machine. Notwithstanding the potential ambiguity of the hypothetical bids, it was clear in the responses that the figures consistently supported the counter argument that the gain was valued more highly than the loss. Based on the mean pledges it did so at a magnitude of around two throughout each of the juries.

On the basis of the median bids, the factor was even greater in favour of the gain by a figure of around four.

Unfortunately, the commentaries associated with these questions provided minimal clarification of the reasons for the counter-intuitive results. Several explanations for the outcome are possible. Firstly, the jurors may have felt a form of budget exhaustion. Having previously offered to assist in the purchase of an additional machine they may have felt that they had 'done their bit'. So when asked to nominate a figure to support the retention of one of the existing units it is possible that they were simply notionally leaving it to others to share the financial burden. Alternatively, the reason may be a much more practical one. It is possible that a question order bias existed. This usually results in a higher value being apportioned to scenarios presented later in the exercise, but in this case it is possible that it may have occurred in the reverse order. Finally, and most probably, the framing of the questions coupled with their mode of delivery may have unintentionally confused the participants. Whatever the reason, it is clear that the results of the jury trials provide little support for the asymmetric value function theory.

#### 5.4.3 Social discount rates.

The social discount rate defines the rate at which people are willing to sacrifice future consumption for present consumption. A high positive rate implies that present consumption is valued much more than deferral of the benefits to some future time, and possibly some future generation. A zero rate indicates an indifference to consumption between the two periods. Only a negative rate will favour complete deferral of consumption to some future time.

The issue for researchers has been to reveal society's preferred rate of discounting. In the absence of any other benchmarks it has become customary to employ the long-term government bond rate. Presently it is around 6%. Being a positive figure it automatically implies a tendency for encouragement of consumption in the present.

It has been argued in this thesis that some indication of a preferred social discount rate can be inferred from people's responses to two primary questions: what is a good worth now, and what annual contribution in perpetuity would people be prepared to make to conserve it in its present condition. By revealing the aggregated annual cashflow the rate of capitalisation becomes evident and this represents the implied discount rate.

Utilising the example of the war monument the mean figures provided by the participants implied a discount rate of around 1%. This rose slightly to approximately 3% based on the

medians. The question put to the jurors involved the issue of allowing the privatisation of the monument. An implied discount rate approaching 6% could be interpreted as a rate for the community to accept a compensation payment in the present as an off-setting benefit against the public loss of the structure. A lower discount rate means that the benefits of collective retention of the monument are preferred over the potential immediate cashflow benefits.

It is of more than just passing interest to reveal a social discount rate. It also has implications for statutory authorities, particularly those considering privatisation of public assets. Although the calculation of a social discount rate was one of the lesser objectives of this thesis, in doing so it suggests that because a more widely acknowledged rate remains largely unrevealed then governments may continue to divest public utilities based on commercial criteria instead of social concerns. In the absence of greater attention to the determination of social discount rates it is likely that public benefits will continue to be converted into private (shareholder) benefits without the public's right to declare its full interest being acknowledged.

## 6.0 SUMMARY AND CONCLUSIONS

### 6.1 Introduction

The primary objective of this thesis has been to report on the efficacy of the values jury process as revealed by a series of trials in which various hypothetical scenarios were presented for the consideration of the participants. The VJ model is a novel alternative to existing forms of public consultation and incorporates a large deliberative and discursive component. Due to its inherent novelty, it was necessary for this study to justify the bridging of the nexus between the stated-preference-based valuation technique incorporated in the research and the deliberative, collective choice model constructed as the vehicle for revealing people's values toward public goods. In seeking to develop such a model, the issues of fairness and competency in the model's communicative processes were identified as primary concerns in assessment of the overall efficacy. In addition to the objectives of identifying these linkages and the subsequent impact on the model's efficacy in delivering beneficial public communication opportunities, several other important objectives underpinned this research. Importantly, it was necessary for an operating protocol to be developed as a result of the trials. In addition, the nature of the valuation data collected offered an opportunity to reveal the measure of community preference for a range of public goods. As a consequence of the collection of such data various tests for the presence and scale of theoretical propositions could be executed. These included identification of the presence of a distinct *consumer* versus *citizen* mode in the behaviour of the participants. In addition, tests for the existence of an asymmetric value function were performed along with an exercise designed to reveal people's social discount rate.

### 6.2 Thesis summary and conclusions

Public authority attention to the demands for enhanced public involvement in decision-making processes has increased considerably in the past four decades. Following an upsurge in awareness that traditional political models tended to favour an elitist approach in most Westernised nations, many authorities have capitulated to the pressure for a shift in thinking and moved toward a more inclusive style of policy determination. While the earliest attempts at pursuing such an approach often used relatively blunt and imprecise methods for eliciting the preferences of the concerned stakeholders, in recent years there has been a trend toward refining such techniques to make them more meaningful. The initial attempts at revealing the will of the broader public tended to concentrate on an approach that favoured broad constituent surveys, public meetings and referenda. While each of these has its merits, the potential for political indifference to influence question framing and delivery in public surveys, and the capacity for

vested interests to ‘stack’ public meetings has resulted in a shift toward a more ethical approach to public values revelation.

In this context the next generation of public consultation models have been dubbed the ‘new deliberative institutions’ (Holland 1999). These include techniques such as focus groups, citizen panels, consensus conferences and citizens’ juries. They are intended to take a much more discursive approach to the consultative process, recognising people’s legitimate interests in a forum setting that respects the mutual concerns of the various stakeholders.

A principle point of departure from the earlier models of public participation is that these innovative approaches tend to emphasise the local and empathetic over the removed and professional. That is, they have focussed on making ‘expertise’ an input into the consultative process rather than making it the primary arbiter. Simultaneously, the depth of knowledge held within the constituency has been elevated as a vital ingredient in the process of arriving at an effective decision. In this regard, the newer models tend to seek out the insights of a peak, representative sample of the stakeholders rather than the potentially uninformed view of the larger community. The principle underpinning this is that for the discursive process to operate effectively the scale of interaction must remain manageable. Open public forums that degenerate into slanging matches and arrive at no particular consensus have, it seems, provided adequate evidence to researchers that a set of operational guidelines is required to enhance the effectiveness of the public consultation process. Limiting the size of forum membership in the pursuit of quality output has been a central element of this shift in thinking. An implied requirement to encourage fairness and competency in such models is the establishment of a generic set of discursive rules or guidelines. Without these, the models risk being harshly judged by sponsoring authorities and participants.

The values jury is an example of the shift in emphasis toward the deliberative and discursive. While in many ways it is similar to a citizens’ jury, the VJ model also attempts to satisfy a need that has existed since the development of cost-benefit analysis in the late 1800’s. It is the requirement for identification of the measure of intensity with which people hold an attachment to goods – in particular, public goods – which are subject to some form of threat. Traditionally, the market has been identified as the prime source of information on such values but, as welfare economics has demonstrated, the impact of externalities and ‘market failure’ often results in an imprecise measure or no measure at all. Additionally, philosophical perceptions that a variety of ‘non-use’ values can also co-exist with instrumental or utilitarian ones makes value elicitation even more challenging. These extra-market values are most simply defined as axiological values:



they reflect an attribute that may demonstrate itself in both private and public fondness, concern or respect for a particular good.

As a means of overcoming the difficulties associated with revealing such a breadth of values alternative sources of information have been sought. This has resulted in the development of a range of proxy measures that tend to fall into the categories of revealed preference or stated preference techniques. To date, the most favoured among the techniques is the stated preference-based contingent valuation method. Its primary advantage is its flexibility. It can be applied to an almost infinite range of goods. Despite this, it is also widely acknowledged as flawed in many of its aspects. It is possibly its relative infancy as a tool that has encouraged such criticism, but researchers *are* continuing to pursue its improvement and mode of application. In the meantime, judicial, administrative, and professional authorities in the United States have recognised its potential as a tool to elicit values in the absence of direct market intelligence. In other Westernised nations its adoption has been slow. Most authorities – including those in Australia – have taken a relatively sanguine view on its efficacy and are awaiting further evidence of its potential prior to making a more formal decision on its capacity. Despite its perceived shortcomings, and in the absence of a more widely respected alternative approach, CV was considered to be the most useful choice of value elicitation technique for inclusion within the values jury model.

In the trials conducted to establish the efficacy of the VJ process the Habermas-Webler model of discursive standard criteria provided a functional framework for both promoting and assessing the effectiveness of the VJ approach. The criteria emphasise the aspects of fairness and competency in rational communication and the 100 jury participants from the four trials provided an assessment of the process on a reflective *ex-post* basis. Overall their judgement was very positive and favourable toward both the VJ format and its discursive capacity. There was evidence to suggest that the jurors felt comfortable with their role and readily adopted a *citizen*-based orientation toward their allotted tasks. In this they appear to have taken a broader temporal and geographic view of the potential consequences of the hypothetical scenarios presented to them and responded appropriately. There was no evidence to suggest that a *consumer*-oriented perspective prevailed in the various juries.

A set of recommended operating protocols has been developed as a result of the VJ trials. Of particular note is the issue that a jury – intended to be representative of the community from which it is drawn - of as few as 23 members holds a degree of statistical merit without compromise on administrative manageability. Matters for consideration by a jury should preferably be of a ‘local’ nature to take advantage of ‘grassroots’ knowledge and empathy.

While the novelty of participation in such an exercise is likely to encourage many potential stakeholders to offer to attend, jury sponsors and researchers should be aware of the disadvantages of self-selected participants. In particular, the potential for vested interests to dominate the verdicts and other outcomes of the process is a constant threat to efficacy. To avoid this, stratified sampling across the affected stakeholder range is possibly the most efficient means of producing a representative cross-section. By implication, attendance payments may be a necessary enticement. Remuneration equivalent to the post-tax *pro-rata* rate of income for the 'average' (median) wage earner in the particular community appears to be a reasonable basis for determining the scale of payments.

Future VJ researchers and their sponsors should be mindful of the large number of biases inherently associated with CV-type exercises and plan to mitigate them to the extent possible.

The fact that the VJ process is an example of a discursive model provides it with one very significant advantage over traditional CV exercises: participants are encouraged to seek clarification if they feel they need it. In this, the typical difficulties that people report with such surveys can potentially be overcome, or at least diminished, by incorporating dialogue with a responsible moderator for the exercise. The role of the moderator is therefore critical to the success of the process. The person selected for the role must be mindful of the significance of their duty, and be knowledgeable about both the topic(s) for consideration and the VJ protocols. Most importantly, they must be aware of their potential to alter jury verdict outcomes simply by the approach they take to their task. In particular, where decision rules are employed that are sensitive to a slight shift in jury orientation, the role of the moderator demands delicacy in administration of the procedure. This is especially so with regard to the delivery of information and the control of dialogue.

In the jury trials conducted as part of this research the primary emphasis was on ascertaining the measure of intensity that stakeholders held toward aspects of the Macquarie Marshes. The Marshes were identified as a typical example of a public good under threat, where the counter-benefits could be recorded in more perceptible socio-economic terms including job-growth and economic development. The demise of the Marshes is much more difficult to represent in such terms. Analysis of the juror responses suggests that employment growth – or at least retention – *can* be off-set in nominal terms against the environmental costs borne by the Marshes. As an example, it was found that each job in the Macquarie Valley is estimated to be worth around 1.6km<sup>2</sup> of wetland. Alternatively, each additional rare or endangered species found present in the Marshes is considered to provide the equivalent benefit to 110 jobs. Jurors also indicated an overall willingness to off-set the improvement in waterbird breeding cycles from the current

four-year pattern down to 2 years in return for all of the 4,400 job related to irrigation usage in the Valley.

Although subject to much less dialogue, several other examples of public goods were presented to the jurors for the consideration of value. Included in these were a kidney dialysis machine, historic building and war monument. Counter to the suggestion by Tversky and Kahneman (1981), the jurors indicated that they were more concerned with the acquisition of an additional dialysis machine than they were with the loss of an existing one. It seems likely that a question-order bias or information delivery problem may have generated such a result. When presented with the historic building scenario, participants confirmed that a measure of public interest, in addition to private market interest, was attached to the structure. If it were possible to have the Local Government authorities impose a premium, payable by those owners of historic buildings who wish to destroy the structures, a compensatory payment to the community of around 70% would be required for the examples used in this research. This same exercise was used to identify the marginal social benefits accruing to the local community as a result of the existence of the particular type of building. The point at which this marginal benefit fell to zero varied widely from 3 (similar historic buildings) in the case of the Warren jury up to 19 in Strathfield. The overall mean was 12. In other words, despite its relative invisibility in market-related terms, substantial public values can attach to locally-significant private assets. Where the particular asset is unique the public interest may represent a premium (of up to 70% in the jury example) that diminishes only relatively marginally as the number of similar buildings in the local vicinity increases. In the case of the war monument the public value premium indicated that people generally consider such an object as akin to a 'sacred site'. The various juries confirmed that the public attachment was many times greater than the mere value of the monument's construction costs. Importantly, when the *reason* for the monument's potential removal was varied (to allow a communications installed for the local ambulance service), the premium diminished considerably. The nature of this response suggests that *intent* is a vital element in the public's perception of social impact.

As a consequence of the trial's focus on the collection of specific economic data sets several tests were devised to reveal various characteristics of the juror's value function. One was for the presence of an asymmetric value function. As noted previously, no evidence was found to support the existence of such a function. Another concerned the existence of an identifiable *citizen* mode within the jurors' value processing functions. While this relies on a quasi-behaviourist interpretation of motivation and is therefore arguably of limited value to the study, evidence was found to support Sagoff's (1988) assumption of its existence. Finally, an attempt was made to synthesise the theory of social discount rating into the data collection procedure.

By substituting present value figures and annualised income streams into a standard discounting model, the juror's implied social discount rate was revealed relative to the value of the various war monuments in question. Based on the use of mean figures it was identified as around 1%. Alternatively, if median figures are employed it was found to be closer to 3%. Regardless of which measure of central tendency is employed, the figure falls well below the usual figure estimated as a proxy for the social discount rate. It suggests that where collective goods are concerned, public authorities may seriously underestimate their value if the long-term government bond rate is employed as the usual benchmark.

This thesis does not advocate that Values Juries (or any of the other deliberative, participatory models) replace elected decision-making bodies as a means of implementing the general will of the public. Instead, it supports the fundamental principle that political decisions can be improved by serious examination of the underlying strength of public preference for any particular range of decision options. Ultimately, criticism about public participation in this process may boil down to the philosophical question of whether policy-makers have adequate faith in the wisdom and judgement of ordinary citizens. If the public is to have a role in the decision-making process, the model of values juries is one that provides a rational and structured approach toward this goal.

### **6.3 A future for the Values Jury model?**

The main reason for giving citizens opportunities to co-determine the make-up of their natural and social environment is neither instrumental nor simply prudential. Beyond the necessity of resolving conflicts and finding most appropriate solutions, participation must also be a reflection of the political goodwill of the authorities who commission research to reveal the measure of public preferences. In other words, there must exist a political culture of inclusiveness. Without this, a genuine commitment to the participatory process is absent and the research exercise may only be of marginal benefit. If the ideal of democracy is to be taken seriously, public participation is a normative prerequisite.

The combining of traditional economic techniques such as CBA with deliberative models of preference revelation should be recognised as merely components of the overall decision-making process which will invariably be based on a balancing of multiple criteria. Participatory-based approaches to the revelation of public values have an essential role to play by making the environment-economy trade-offs explicit at various decision-making levels. These approaches to the quantification of public values will – in time – gain in terms of

transparency and meaningfulness. The quantifiable information can then play its part in the facilitation of the overall, real world, multi-criteria decision-making process.

As an example of the deliberative, consultative *genre*, the VJ has certain advantages over the more established techniques for public participation. In particular, the limited scale of stakeholder participation should encourage the revelation of well-informed, reflective, local concerns and preferences in a forum that promotes an ethic of mutual respect for the views of all parties. By incorporating the element of value measurement using a well-understood metric (commonly a monetary one), the values jury can extend the typical referenda style approach into one that also identified the intensity with which people hold their preferences. Certain theoretical limitations may constrain the use to which the quantified outcomes and verdicts can be applied, but if these are recognised the future potential for the model will be more apparent. In particular, Arrow's (1951) 'general possibility theorem' and the various CV-related issues may inhibit the values jury range of applications but there appears to be no reason to avoid further trial of the model solely because of this. Its inherent flexibility and potential for deployment under a broad range of conditions concerning a wide variety of issues – both public and private – should appeal to researchers seeking to quantify that most elusive of characteristics, the intensity of people's preferences.

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## APPENDIX 1

### The discursive standard criteria (adapted from Webler 1995)

#### 1. *Speech acts and validity claims.*

Habermas uses speech act theory to explain what people do in discourse. He focuses on four types of speech acts. Each speech act also makes an implicit validity claim. It is this that is the essential truth-oriented component of a statement.

Communicative speech acts are 'trivial' because they merely claim to be understandable utterances. Their validity claim is to *comprehensibility*, and is grounded in *language*.

For example: 'During a discourse, people speak to one another.' This is simply a grammatically correct sentence

Constantive speech acts claim to represent something in the objectifiable world. The claim they make to validity is *truth* or *correctness*.

For example: 'Average annual rainfall here is 500 millimetres.' This is a verifiable fact.

Regulative speech acts propose an appropriate set of interpersonal relations or norms. Their validity claim is to *rightness*.

For example: 'We should not trade jobs for the loss of endangered species.' This is a normative contention.

Representative speech acts reveal a selective element of the speaker's own objectivity. In doing so, they make validity claims to *truthfulness* and *sincerity*.

For example: 'I am pleased to hear that you agree.' This is an expression of personal subjectivity.

According to Habermas, all rationally-motivated communication centres around these four types of speech acts. Habermas believes that the various validity claims require fundamentally different means of *redemption*. That is, the process by which the discourse participants decide

whether or not the speaker's validity claim is actually valid. Thus, he distinguishes four types of discourse: explicative, theoretical, practical, and therapeutic.

## *2. The discursive standard criteria for fairness.*

Fairness is an assessment made from the point of view of the individual participant about the sufficiency of opportunities to express and protect their personal interests and to contribute to the development of the collective will. In a fair discourse, each participant should feel safe about advancing statements and participating in judging the validity of other's claims. Whether or not the individual utilises the ability to make maximum use of these opportunities is something that is more generally covered under 'competency'.

There are four major elements to the fairness criterion:

- Attendance at the event.
- Initiation of speech acts.
- Participation in debate about validity claim redemption.
- Participation in the group resolution of disputes over claims.

From an interest in fairness, three activities in public participation are important to distinguish: agenda and rulemaking, moderation and rule enforcement, and discussion. Below is listed the criteria for indicators that evaluate fairness in that activity.

### **A. Making of the agenda and the process rules.**

Does the model:

- A1. provide each participant with an equal chance to put their concerns on the agenda and to approve rules for discourse?
- A2. provide each participant with an equal opportunity to debate and critique proposals for the agenda and the discourse rules?
- A3. ensure that each participant has an equal chance to influence the final decision about the agenda and discourse rules?

### **B. Moderator and rule enforcement.**

Does the model:



- B1. provide each participant with an equal opportunity to suggest a moderator and a method for facilitation?
- B2. provide everyone with an equal opportunity to challenge and support suggestions by others for a moderator and a method for facilitation?
- B3. provide everyone with an equal opportunity to influence the final selection of a moderator and a moderation method?

C. Discussion.

Does the model:

- C1. provide everyone who is potentially affected by the decision proposal (positively and negatively) an equal chance to be present or represented at the discourse?
- C2. make certain that each participant has an equal chance to express and criticise claims about language, facts, norms, and expressions?
- C3. ensure that the method chosen to resolve validity claim redemption dispute is consensually chosen prior to the commencement of discourse?

3. *The discursive standard criteria for competence.*

Competence refers the ability of the participation decision-making process to provide the participants with the procedural tools and knowledge needed to make the best possible decisions. There are two major elements associated with this criterion:

- Access to knowledge and interpretations.
- Implementation of the best possible procedures for resolving disputes about knowledge and interpretations.

There should be competence in all four type of discourse that occur:

Explicative discourse. References are made to language, terms, definitions, and grammar.

Theoretical discourse. References are made to the objectified world.

Practical discourse. References are made to social needs and the appropriate forms of social interaction.

Therapeutic discourse. References are made to the subjectivity of the speaker.

D. Rules for redeeming comprehensibility validity claims.

Does the model:

- D1. provide each participant with equal access to the sources for commonly agreed-upon standards and definitions?
- D2. confirm that everyone has an understanding of each other's terms, definitions, and concepts?
- D3. make certain that disputes about definitions, terms, and concepts take advantage of pre-established reference standards?

E. Rules for redeeming truth validity claims.

Does the model:

- E1. provide each participant with equal access to the available and relevant systematic knowledge about the objective world?
- E2. provide every one with equal access to the available and relevant anecdotal and intuitive knowledge about the objective world?
- E3. make certain that the uncertainty of factual information is considered along with content?
- E4. include a mechanism to check if factual claims are consistent with the prevailing opinion in the expert community or consistent with the anecdotal knowledge of other people not involved in the discourse?
- E5. provide a means to separate cognitive claims from normative claims?
- E6. provide the participants with the option to delegate determinations of factual truth to an outside expert panel?
- E7. ensure that cognitive legal claims are examined by legal experts?

F. Rules for redeeming normative validity claims.

Does the model:

- F1. contain any implicit barriers that will bias the distribution of interest that participate?

- F2. determine the affected population using objective criteria and also allow the people in the general region to make subjective determinations?
- F3. promote both the discovery and development of mutual understandings of values among all of the participants?
- F4. make sure that factual implications of normative choices are considered in practical discourse?
- F5. promote – through rational and formal discourse procedure that build compromises – the discovery and development of a mutual understanding of values in order to formulate a generalised will?
- F6. ensure that normative choices are not inconsistent with themselves or with the general will?
- F7. ensure that normative choices are not incompatible with applicable laws?
- F8. make sure that normative choices are compatible with present expectations?

G. Rules for redeeming truthfulness validity claims.

Does the model:

- G1. promote discussion about the authenticity of the speaker's expressive claims?
- G2. encourage an examination of the speaker's sincerity?
- G3. promote an examination into the qualities of the situation?
- G4. provide individuals enough time to accurately state and defend their expressive claims?
- G5. use a translation scheme that is acceptable to everyone?

H. All categories.

Does the model:

- H1. attempt to reduce misunderstanding before reaching for agreement?
- H2. use a technique that is consensually pre-approved regarding decisions as to the redemption of the validity claims?

**APPENDIX 2**

**Sources of bias in stated preference techniques** (adapted from Mitchell and Carson 1989)

Mitchell and Carson believe that the principal sources of systematic bias – and therefore error – in stated preference techniques evolve from four main issues. These are:

- 1. Use of a scenario that contains strong incentives for respondents to misrepresent their true estimates of value.
- 2. Use of scenarios that contain strong incentives for respondents to improperly rely on elements of the scenario to help determine their valuation amounts
- 3. Mis-specification of the scenario by incorrectly describing some aspect of it, or alternatively, by presenting a correct description in such a way that respondents misperceive it.
- 4. Improper sampling design or execution, and improper benefit aggregation.

They go on to describe the types of bias inherently associated with each of these four issues. The following table summarises the various biases common to stated preference techniques

Type of bias found in stated preference surveys	Description	Implication for values jury process
Strategic bias	Strategic bias occurs when respondents deliberately shape their answers to influence the study’s outcome in a way that serves their personal interest.	Employ median or $\alpha$ -trimmed mean to derive a meaningful valuation figure that more truly reflects the collective choice of the group.
Compliance bias	People may generally be motivated to tell the truth, but are prone to shape their answers to please the interviewer or sponsor, especially when they do not have a strong or well-formed view on the survey topic.	Difficult to overcome except with an appropriate level of dialogue between the moderator/facilitator and the jury members to ensure they understand that it is <i>their</i> choice that is fundamental to the whole exercise.

Starting point bias	This occurs when the respondent's answer is influenced by the value introduced by the scenario (particularly applicable to elicitation techniques involving bidding games)	In most cases the only starting point will be some estimate of 'market value' upon which the respondent's own assessment of value is to be added. The absence of a market value is likely to make assessment of any form of axiological value very speculative.
Range bias	Occurs when participants are provided with a range of payment scale options, and they consider that their answer must be expected to be within this range	The preferred method of value identification is by open-ended estimates, unconstrained by a range.
Relational bias	Occurs when the amenity being valued is linked to some other public good in such a manner that the other good implies a value in a way unintended by the researcher.	Difficult to overcome except with adequate dialogue to ensure participants understand the differentiation between the goods in question.
Importance bias	May occur when a respondent infers that the amenity being valued has enhanced importance (and therefore value) otherwise such an elaborate and expensive research effort to elicit values would not otherwise be undertaken.	May be overcome with adequate dialogue between the moderator/facilitator and the jury members to ensure clarity prevails.
Position bias	Respondents who are aware that they are being asked a sequence of valuation questions may infer something about the scale of the associated values from the actual sequence of the questions.	Overcome by adequate dialogue between the moderator/facilitator and the members of the jury.

Symbolic bias	Occurs when respondents react to an amenity's general symbolic meaning instead of its specific levels of provision as described in the exercise.	Overcome by re-iteration of the level at which the valuation exercise is being conducted. Dialogue is central to dealing with this issue.
Part-whole bias	This results when people respond to the good's larger-scale symbolism rather than to the specific description offered in the survey.	Overcome by ensuring participants are fully aware of the limitations of the exercise so that confusion between the part and the whole is limited. Dialogue is useful in ameliorating this potential bias.
Property right bias	Caused by the respondent's ambiguity about whether they already have a right to 'own' the public good in question or whether they consider it appropriate that they have to pay to acquire it.	Participants may be asked to respond as either 'owners' or potential 'acquirers' in the jury exercise. In many cases it may be useful to ask participants to play one role and then the other so that a comparison of the results is possible.
Method of provision bias	Provision of a public good by public charities may evoke a higher estimate of value than if the same good were to be provided by some other authority such as a government department.	This may not necessarily be a 'bad' bias in that people may be willing to discount their collective value by some factor associated with the benevolence of the provider or acquirer of the public good. Conversely, hostility toward the provider/acquirer may be reflected in the demand for a premium payment (particularly under WTA conditions).

Budget constraint bias	This results in WTP exercises when respondents do not take their budget limitations into account as they would when they actually purchase a usual consumer good.	The jury setting is conducive to asking the participants what their true budget constraint is. For example, 'how much did you donate to environmental causes in the past year?'
Elicitation question bias	Occurs when the question asked by the researcher fails to convey a request for the highest amount that the respondent will realistically pay (in a WTP exercise) and is unsuccessful in confirming that the respondent must be able to firmly commit to that amount in practice.	Overcome by providing adequate information and potential for dialogue in the jury setting.
Instrument context bias	Occurs when the questionnaire materials that precede the scenario being described influence the valuation amounts. This may result in 'priming' or coercion of respondents.	Important that the moderator/facilitator act as impartially as possible and encourages dialogue to enable participants to derive their own honest answers.
Question order bias	Occurs when respondents infer from the question order sequence an expected higher value for scenarios presented later in the valuation exercise.	Difficult to overcome except with awareness by the moderator/facilitator and adequate dialogue.
Population choice bias	Occurs when the researcher mis-identifies the population whose values are to be obtained. Choosing the correct population is easiest when those who are to be surveyed appropriately represent those affected by the scenario.	This may limit the type of questions that can be successfully considered by a values jury. In most cases where 'local' goods and issues are concerned the jury process may have a significant advantage over alternative public preference methods.

Sample frame bias	Even if the appropriate population can be identified, using an incorrect sampling frame will distort the results. Probability sampling is the preferred method in most cases.	The number of participants in a jury is relatively small compared to the scale of other stated preference techniques. This conditions is much more conducive to random sampling.
Non-response bias	Different categories of respondents (for example, those with higher or lower education or incomes) may employ a non-response strategy to various questions resulting in their exclusion from the study. This may bias the study's findings in favour of those who actually do respond.	Dialogue between the moderator/facilitator and the jury members should discourage non-responses. Even a response that may be regarded as an outlier is better than no response as it provides a 'vote' that has a scale. If jury members wish to indicate a 'protest' vote, space on the their response documents should be made available to allow them to register such a sentiment in addition to their valuation figure.
Temporal selection bias	Occurs when the time-frame in which the survey is undertaken has an unintended impact on the respondent's perceptions of the issue. Similarly, public perceptions of the issue may be subject to change over time.	The ease with which juries can be commissioned should encourage them to be seen as a flexible means of re-eliciting a particular value at any time. As with all values, the value elicited in a jury exercise may be subject to change over time and are best seen by decision-makers as 'floating' rather than 'fixed'.
Sequence aggregation bias	Occurs when an attempt to sum the values of small policy changes is used to value a large change in policy.	Overcome by appropriate dialogue with the jury members so that they understand exactly what they are being asked to do.



## **APPENDIX 3**

### **The Macquarie Valley and the role of the Macquarie Marshes**

The Macquarie Valley is part of the Murray-Darling Basin and is located in north-west New South Wales, between the Lachlan and Barwon Valleys. The Valley extends 460 km north-west, commencing at the Great Dividing Range near Bathurst and spanning across the western plains to Bourke. It covers an area of 73,000 km<sup>2</sup> and contains ten major cities and towns: Bathurst, Orange, Mudgee, Wellington, Dubbo, Narromine, Warren, Nyngan, Brewarrina, and Bourke. Three of these - Orange, Dubbo, and Bathurst – have populations in excess of 20,000 people.

The Macquarie River is formed by the confluence of the Fish and Campbell Rivers upstream of Bathurst. Its main tributaries are the Turon, Cudgegong, Bell, Little, Talbragar and Castlereagh Rivers. The Macquarie Marshes extend for approximately 100 km commencing about 50km north of Warren.

There are nine dams in the Macquarie Valley with a capacity in excess of 5000 megalitres (ML) and five major weirs downstream of Dubbo. Burrendong Dam, the largest dam in the Macquarie Valley, was completed in 1967 and has a storage capacity of 1,189,000ML and a catchment area of 13,900 km<sup>2</sup>. The average annual regulated flow from Burrendong Dam (measured at Narromine) is 475,000ML. Windamere Dam, which is the second largest dam in the Macquarie Valley, was completed in 1984. It is on the Cudgegong River upstream of Mudgee. It has a capacity of 353,000 ML, a catchment area of 1070 square km and an average yearly flow of 60,000 ML. Only a small part of the licensed irrigation area between Windamere and Burrendong Dams has been developed, so most of the inflows into Windamere Dam are released when Burrendong is nearly empty.

The main economic activity in the Macquarie Valley is agriculture. The average total revenue from agricultural production in the Macquarie Valley in mid-1990s was estimated to be \$642 million, including \$292 million in crop production (Department of Land and Water Conservation 1998). The total area of crops and pastures in the Macquarie Valley in the same period was 639,321 hectares. About 14.5% of this area, or 93,000 ha, was irrigated.

Cotton production generates the highest total revenue of the irrigated crops in the Macquarie Valley, averaging around \$100m per annum (DLWC 1998). Irrigated cotton uses more than 50% of regulated water in the valley and accounts for about 44% of the total irrigated area

(DLWC 1995). Other irrigated crops include cereals and wheat, oilseed, citrus, lucerne, pasture and fodder, vegetables and vines. Cotton is also the most valuable irrigated crop in the Valley on a per hectare basis, with the gross margin for cotton reported to be \$870/ha (Morrison and Bennett 1997). The next highest gross margins are for irrigated summer cereal (\$500/ha) and irrigated lucerne (\$500/ha).

Water was originally allocated in the Macquarie Valley on the basis of the area that was licensed for irrigation. The only control of the volume of irrigation was a limit on the amount of area that was licensed. Licences to extract water from regulated streams could be received by application to the Department of Water Resources until an embargo was placed on the declaration of further licences in 1979.

In September 1981 a volumetric allocation scheme was introduced into the Valley because of shortages in the supply of water for irrigation. Under the scheme, irrigators were given an annual allocation of water according to their licensed area. The allocation was 8ML/ha for non-permanent plantings, and between 10 and 12 ML/ha for permanent plantings such as vines. Allocations were also made for manufacturing, mining, large grazing enterprises, and for recreational activities. When the amount of water available is insufficient to supply irrigators with 100% of their annual allocations, it is allocated in proportion to the available storage supply. This means that if an irrigator holds an allocation of 10ML/ha and water is only available to meet 50% of annual allocations, the irrigator receives only 5ML/ha. Irrigators in the Macquarie Valley receive their full allocation in about 65% of years (Morrison and Bennett 1997).

The use of on-farm storages has increased substantially over the past decade. On-farm storages are dams located away from the River and other structures, that can be used to hold water for irrigation. On-farm storage of water in the Macquarie Valley increased from 15,000ML capacity in 1986 to an estimated 75,000 ML in 1995 (DLWC 1995). These structures are often used to store water from floods originating downstream of Burrendong Dam, or from dam spills.

Powell (1995) estimates a decrease in the value of agricultural output of approximately \$3.0 million, and a fall in employment by 44 jobs, for every 10,000ML reduction in irrigation water. Conversely, DLWC (1995) estimate that gross income in the region would decline by only \$600,000 per year for the same reduction in flow.

The Macquarie Marshes are the main wetland areas in the Macquarie Valley. They consist of semi-permanent wetland (40,000 ha), slightly elevated lower floodplain (32,000 ha), and more elevated higher floodplain area (89,000 ha) (National Parks and Wildlife Service 1995).

The Macquarie Marshes are known for their waterbirds, and provide habitat for more than 62 species. Kingsford and Thomas (1995) estimate that between 10,000 and 300,000 waterbirds use the Macquarie Marshes every October depending on the extent of flooding. Seven waterbirds listed as endangered by the NSW National Parks and Wildlife Service exist in the Macquarie Marshes. Eight other birds listed as endangered also exist in the Macquarie Marshes. There have also been 15 waterbirds listed under the China-Australia Migratory Birds Agreement (CAMBA) and 11 waterbirds listed under the Japan-Australia Migratory Birds Agreement (JAMBA) sighted in the Macquarie Marshes between 1983 and 1993 (Kingsford and Thomas 1995).

Within the Macquarie Marshes there is a Nature Reserve covering 18,150ha that is managed by the NSW National Parks and Wildlife Service. This consists of a northern and southern nature reserve which are separated by approximately 20 km. The Macquarie Marshes Nature Reserve is listed as a Wetland of International Importance under the Ramsar Convention, and is also listed by the National Trust of Australia (NSW) and the Australian Heritage Commission.

The Marshes have been used for grazing cattle and sheep since the mid-1800s. The areas of water couch in particular, have provided rich grazing pastures. Grazing was allowed in the Nature Reserve through leases until August 1990.

Flooding in the Marshes has declined over the past 50 years. Kingsford and Thomas (1995) report that the area affected by large floods has contracted by 40-50% between 1944 and 1993. This is primarily because of reduced flows into the Marshes. The frequency and timing of floods has also changed significantly. The frequency of medium and high floods reaching the Marshes has decreased (Kingsford and Thomas 1995) and the proportion of low flows has sharply increased (NSW Environment Protection Authority 1995). The natural flow regime once mainly consisted of high winter and low summer flows, but this has generally been reversed by regulation and extractive uses.

Morrison and Bennett (1997) report that the area of river red gums fell from 1407 ha in 1934 to 636 ha in 1981, a decline of about 55%. Water logging has caused a portion of this, but the majority have been killed by reduced flooding and clearing. Brereton (1994) reports that water

couch, which is important feed for stock and waterbirds, has decreased by up to 40% between 1949 and 1991. Exotic species have also affected large areas of the Marshes.

Waterbird breeding events provide an indication of wetland health. NPWS (1995) list four requirements for successful waterbird breeding events. These are the existence of living river redgums, flooding of sufficient volume, flooding of sufficient duration, and flooding at a suitable time of year. As a result of changes in these parameters, the numbers of waterbirds breeding in the Marshes has declined (Johnson 1994).

Kingsford and Thomas (1995) examined the relationship between flooding and trends in waterbird populations in the Macquarie Marshes between 1983 and 1993. A significant decline in the number of species and the density of waterbirds was found.

The native stocks of fish in the Marshes have also declined in abundance and diversity, while introduced species – particularly European carp and gambusia – have increased rapidly (Morrison and Bennett 1997).

Water quality is monitored at two locations upstream of the Macquarie Marshes, and one on the downstream side. Water quality monitoring and flow data from these sites suggests that the Macquarie Marshes improves downstream water quality by filtering phosphorus, nitrogen and many suspended solids (Department of Water Resources 1994). Filtering occurs when flow levels are large enough for water to leave the channels within the Marshes and spread overland through vegetated areas. DWR (1994) estimated that as a result of the filtering process the total phosphorus load on the downstream side of the Marshes is generally only about half the load at upstream monitoring stations.

Due to concern about the impacts of reduced flows on wetland quality, in September 1995 the NSW Government decided that extra water should be allocated to the Macquarie Marshes. Immediate measures were initially put in place and were then confirmed in the Macquarie Marshes Water Management Plan 1996 (DLWC 1996). The plan included an additional 75,000 ML per year of general security wildlife allocation (that can be received when irrigation allocation levels exceed 10%). A limit of 50,000 ML a year was placed on the use of flows from unregulated tributaries to the Macquarie River and dam spills. The net result of these changes is that average flows to the Marshes will increase by about 50,000 ML per year to 450,000 ML, compared to 525,000 ML per year under pre-regulatory flow conditions. Median flow to the Marshes will increase from 315,000ML per year to 380,000 ML per year, compared

to 465,000 ML per year under natural flow conditions. Average diversions for irrigation will be reduced from 395,000 ML per year to 340,000 ML per year (DLWC 1996).

The intention of the 1996 Plan is to secure water in order to halt further decline of wetland quality in the Macquarie Marshes. In the longer term several positive impacts are expected. It is likely that waterbird breeding, numbers, and diversity will increase. It is also expected that vegetation in the area of semi-permanent and lower floodplain wetland will be stabilised at levels that existed before the reallocation. However, vegetation in the higher floodplain will receive little benefit from the extra water.

The reallocation is also expected to benefit many graziers and some irrigators within the downstream section of the Marshes as a result of additional water flows. However, there will be costs involved for irrigators in the Macquarie Valley upstream of the Macquarie Marshes. Whether the changes to Marsh water flow patterns results in a significant increase in the welfare of the community in general, remains a topic of much debate.

## APPENDIX 4

### The Values Jury Questionnaire and supporting University Ethics clearance



1 April 1998

Mr Patrick Lally  
GPO Box 4577  
SYDNEY NSW 2001

Dear Mr Lally

#### **"Community valuation of local environmental features"**

Approval of the above application is granted effective 27 March 1998, subject to your compliance with the following conditions:

//The application states in section 5.4 that the targeted participant groups are environmentalists and real estate valuers. However, the information letter to potential participants states that they have been randomly selected from a local telephone directory. Is this an intentional deception, or has the application failed to adequately describe the target population and specifically how it will be recruited? If a deception is intended, it must be justified in the application and a process for debriefing participants afterwards as to the nature of the deception should be in place. If this contradiction is unintended, then clearer information on the target population should be provided along with information regarding how names of potential participants will be obtained. Information letters to participants should accurately reflect the recruitment process.

//The consent section of the information letter should include the title of the research project, so that the project to which the consent applies can be clearly identified. For example, the first sentence could be reworded as follows: "Please complete this form if you would like to participate in the research project on 'Community valuation of local environmental features' described in the accompanying letter."

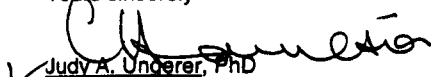
//Amended information and consent letters should be sent to the Committee secretary **before this research is commenced.**

Approval will be for a period of twelve months. At the end of this period you are required to submit a final report on the project (or on completion of the project, if earlier), or an application for renewal of the approval if the project is still current. (The Final Report format is located with the Application for Renewal on the Web.)

You must inform the committee of your willingness to accept and comply with any conditions by signing the Agreement Statement at the end of this letter, and returning one copy of this Agreement to the Committee Secretary, Mrs C Hamilton. If amendments to information and consent forms are requested, copies must accompany the Agreement.

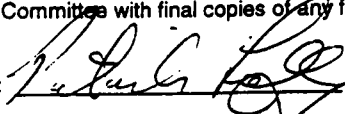
Please remember that if your project aims change in a manner which results in alteration of the protocol, the Ethics Review Committee (Human Research) must be notified. You must also notify the committee immediately in the event of any adverse effects on participants or of any unforeseen events that might affect continued ethical acceptability of the project. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University ([Http://www.ro.mq.edu.au/HEthics/ethicsguide.html](http://www.ro.mq.edu.au/HEthics/ethicsguide.html)).

Yours sincerely

  
Judy A. Underer, PhD  
Chair, Ethics Review Committee (Human Research)

I, **PATRICK LALLY**, agree to comply with the conditions of approval specified in this memorandum. I also agree to provide the Committee with final copies of any forms requiring amendment.

SIGNATURE:

 DATE: 6.4.98

**MACQUARIE UNIVERSITY**

SYDNEY, NSW, 2109, AUSTRALIA

T'phone: 02) 9850 7448

Facsimile: 02) 9850 8799 email: [cynthia.hamilton@mq.edu.au](mailto:cynthia.hamilton@mq.edu.au)



5 May 1998

Mr Patrick Lally  
GPO Box 4577  
SYDNEY NSW 2001

Dear Mr Lally

**Community valuation of local environmental features"**

The requested information and requested revisions have now been reviewed and approved. All conditions for full approval have been met.

Yours sincerely,

Judy A. Ungerer, PhD  
Chair, Ethics Review Committee (Human Research)

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**MACQUARIE UNIVERSITY**  
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## **The Values Jury Questionnaire**

### **Objective of the values jury process**

The objective of the values jury you are participating in is to determine the magnitudes of value that people within a specific community assign to particular features and aspects of their local environment.

For this reason, we will take a reasonably broad definition of the environment to include all features of our surroundings that have historic, scientific, cultural, social, archeological, architectural, aesthetic and natural significance.

Generally, the scenarios being presented to you are hypothetical ones, but you are asked to give them their due consideration because even if they do not represent actual events, they do reflect the type of real life scenarios that citizens and public decision-makers in a community have to contend with.

The exception to the fictional scenarios is a significant issue that has broad implications for the Macquarie Valley. As part of the jury process, you will be presented with two sides of the debate about this topic by two experts and you will be asked to answer a series of questions as a means of providing your verdict.

I trust you find the experience interesting and thought-provoking.



### Personal characteristics (section 1)

- [illegible]



8 Is the property you currently live in 'for sale':

☐ No ☐ Yes

9 How long have you lived in the property: \_\_\_\_\_ years

10 What do you think the current 'market value' is: \$ \_\_\_\_\_

11 If someone was willing to pay you whatever price you needed to sell the property today, what price would you ask: \$ \_\_\_\_\_

12 Would you be negotiable on this price (say, reduce it by 5% ) and still be prepared to sell it:

☐ No ☐ Yes

13 How much does it cost you to insure your house each year (excluding contents):

\$ \_\_\_\_\_

14 If the cost to insure your house was to increased dramatically, what is the maximum increased policy price you would be prepared to pay to keep it insured at its present level rather than not have it insured: (the example in brackets is based on a \$200 current policy price)

- |   |  |
|---|--|
| <input type="checkbox"/> 1.1x (i.e. 10% increase) (\$220) | <input type="checkbox"/> 1.25x (i.e. 25% increase) (\$250) |
| <input type="checkbox"/> 1.5x (i.e. 50% increase) (\$300) | <input type="checkbox"/> 2x (\$400)                        |
| <input type="checkbox"/> 3x (\$600)                       | <input type="checkbox"/> 4x (\$800)                        |
| <input type="checkbox"/> 5x (\$1000)                      | <input type="checkbox"/> 10x (\$2000)                      |
| <input type="checkbox"/> 20x (\$4000)                     | <input type="checkbox"/> 30x (\$6000)                      |
| <input type="checkbox"/> 40x (\$8000)                     | <input type="checkbox"/> 50x (\$10 000)                    |
| <input type="checkbox"/> 100x (\$20 000)                  |  |

15 Comments:

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16 In the past 12 months how much do you think that your household spent on charitable causes, including donations (to welfare, school, health, religious, environmental or sporting causes). If you bought, for example, tickets to a charity ball or tickets in raffles or paid membership to a public organisation, exclude the amount you might have paid for the 'entertainment' component of your tickets: \$ \_\_\_\_\_

17 How much of this amount was spent on 'environmental' causes: \$ \_\_\_\_\_

18 Thinking of your household's total budget, what was the maximum you could have spent on charitable causes in the 12-month period: \$ \_\_\_\_\_

19 How much time did your household spend working for charitable causes in the past 12 months (including, for example, school tuck shop, organising children's sport, church cleaning, public tree planting): \_\_\_\_\_ hours

20 If you had more time to spend on any of the following types of local charitable activities how would you prioritise your time: (please rank from 1-6)

- ☐ Welfare (e.g. collecting for charity, visiting sick people)
- ☐ Sporting (e.g. organising children's sport, fundraising)
- ☐ Religious (e.g. church cleaning, assisting local clerics)
- ☐ Educational (e.g. assisting at school activities, P & C activities)
- ☐ Environmental (e.g. local tree planting, lobbying)
- ☐ Health (e.g. assisting with patient transport, fundraising)

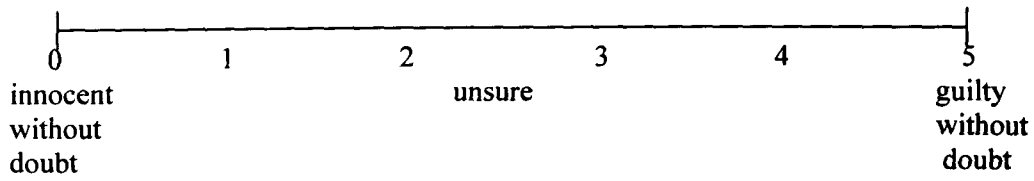
21 If you were given \$1000 to distribute to local charitable causes, how would you allocate it:

\$ _____	Welfare	\$ _____	Sporting	\$ _____	Religious
\$ _____	Educational	\$ _____	Environmental	\$ _____	Health

22 Was OJ Simpson guilty:

☐ No      ☐ Yes      (please tick)

23 How sure are you of his guilt:      (place tick on the line)



24 Comments:

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The Federal Government has decided to enable the people of Australia to build up a 'fighting fund' to be used for the public purchase of environmentally sensitive sites when/if they become a target for significant impacts such as mining or demolition. Acquisition would allow the sites to be purchased and maintained in their present condition. The fund is to be built up from an annual taxation impost, of a reduction in welfare payments.

25 What is the maximum increase in tax, or reduction in welfare benefit, for one year only, that you would be prepared to accept on behalf of your household, to support such a fund:

\$ \_\_\_\_\_

26 What is the maximum increase in tax, or reduction in welfare benefit, that you would be prepared to accept on behalf of your household, on the basis that it remains as a levy for an indefinite period (similar to the Medicare levy):

\$ \_\_\_\_\_ per year

27 Comments:

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There has been a reasonably dramatic increase in the number of cases of kidney disorders in the local government area recently and an extra dialysis machine is required by the local hospital. Patients are still able to make use of the dialysis resources at \_\_\_\_\_ (next major hospital), but it will entail a significant amount of travelling on a regular basis. Of course, this may become a problem in the case of an emergency situation. The State Government recognises the need for the hospital to have the new machine, but it will only contribute a small portion of the funds at present although it may have the funds available in a few years.

- 28 Should the hospital proceed with the purchase now, on the basis that the local community will be asked to pay for the machine (via, for example, hospital fetes and charity events):

☐ No ☐ Yes (please tick)

- 29 If you, on behalf of your household, were asked to make a once-only contribution, how much would you be prepared to give: \$ \_\_\_\_\_

- 30 If, instead, the hospital has decided to lease the machine over an extended (indefinite) period, how much would you be prepared to commit to each year (the amount would be added to annual Council rates): \$ \_\_\_\_\_ per year

- 31 Regardless of the cost of the machine, local Council has asked you to recommend an amount that each household will be levied on a once-only basis to assist in paying for the machine.

What is your recommendation: \$ \_\_\_\_\_

- 32 Alternatively, Council has decided a continuing annual levy will be charged to all households in the local Government area to assist with paying for the machine over an extended period.

What amount would you recommend be charged: \$ \_\_\_\_\_ per year

- 33 Comments:

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In reality, the local hospital actually has adequate capacity to meet the needs of the local community as far as dialysis machines are concerned. In fact, because there is an excess capacity to meet the community needs, the Government has decided to remove one of the two existing machines to a hospital elsewhere that needs additional resources. The one remaining machine will be adequate to cope with a large proportion of the community needs but it is likely that some patients will have to travel to \_\_\_\_\_ (next major hospital) on a regular basis for treatment. Difficulties may also arise if an emergency situation is encountered.

34 Should the local hospital forgo one of its machines under these circumstances:

☐ No

☐ Yes (please tick)

35 If, on behalf of your household, you were asked to make a once-only contribution to a 'fighting fund', to keep the second machine, how much would you contribute: \$ \_\_\_\_\_

36 If, instead, the hospital is allowed to retain the machine, but only on the basis that local householders continue to make an annual contribution, how much would you be willing to pay for an indefinite period (payable by an impost on your Council rates):  
\$ \_\_\_\_\_ per year

37 Regardless of the cost of keeping the machine in the local hospital, local Council has asked you to recommend an amount that each household should be levied, on a once-only basis, to help keep the machine in the local hospital. What is your recommendation:  
\$ \_\_\_\_\_

38 Alternatively, Council has asked you to nominate the annual amount to be levied on each household for an indefinite period to enable the machine to be kept in the local hospital. What amount would you recommend: \$ \_\_\_\_\_ per year

39 The State government has come up with an interesting suggestion: it will remove the second dialysis machine and compensate each household in the local Council area with a once-only direct cash compensation payment (you can keep the money that the Government provides to your household). How much would you expect to receive:  
\$ \_\_\_\_\_

40 Comments:

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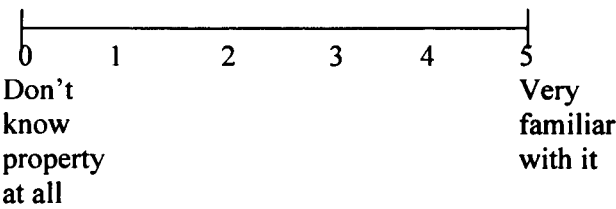
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Look at the picture of the local historic building (brief specific details of its location, age and history provided by the moderator).

41 Please indicate your degree of familiarity with the property: (place a tick on the line)



The property is owned privately, in good condition and (as far as this exercise is concerned) there is no regulation that forbids the owner doing what they wish with the property, including complete demolition.

42 Should the owner have unrestricted rights to do whatever they wish with the building:

- ☐ No                      ☐ Yes

43 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

A property developer has confirmed his intentions to buy the property and then demolish the structure so that he can construct a new building on the site. The current estimated market value of the property is \$ \_\_\_\_\_ (to be provided by the moderator). This is composed of land value \$ \_\_\_\_\_ plus separate value of the building \$ \_\_\_\_\_.

44 If local the Council was in a position to charge the developer an amount in addition to the purchase price to fully compensate the community for the loss of the building, how much do you think they should charge (assume that any additional charge paid by the purchaser is directed by Council for community enhancing activities such as welfare support,

cultural activities, provision of health or educational facilities, or construction of community-benefiting facilities): \$ \_\_\_\_\_

45 In fact, the house in the picture is not unique. A similar building was constructed near-by at around the same time as this one. It has very similar features and is also a good representation of the era in which it was built. So the loss of the building in question would not represent the end of all traces of the architecture of the era. This second property is under no threat of destruction. Given that the building in question is not totally unique, what additional amount do you think the developer should now be charged by Council: \$ \_\_\_\_\_

46 How many similar styled buildings should exist in the local area before you would allow the building in question to be sold simply for its market value: \_\_\_\_\_

47 If the developer's additional payment was paid directly to the households of the local government area instead of into a Council controlled fund, what payment would you be satisfied with to compensate you for the loss of the building: \$ \_\_\_\_\_

48 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please look at the picture of the local war memorial

49 Please indicate your level of familiarity with the site: (place a tick on the line)

0 1 2 3 4 5  
Don't know the site Very familiar with it

50 Do you think there are any circumstances under which the monument should be allowed to be sold to private interests (for example, Council can't afford to maintain it):

☐ No ☐ Yes

A commercial land developer has approached your local Council with a view of purchasing the monument for placement near the entrance to a housing development he is planning (to provide it with a theme). It will have gardens surrounding it and will be well maintained. All existing right of public access will continue. It would cost the developer \$ \_\_\_\_\_ to have a replica of the monument built (in the absence of any other detail, this amount therefore also represents the monument's potential market value) but, obviously, it would lack the authenticity of the original.

51 The developer is willing to pay a premium to acquire the monument. How much do think he should pay for it (note that all proceeds over the 'market value' will be strictly dedicated by Council to community-benefiting activities): \$ \_\_\_\_\_

52 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- 53 If there were two very similar memorials in the vicinity, and the other one will remain untouched, how much do you think that the developer should now be asked to pay for the one in question: \$ \_\_\_\_\_
- 54 How much would you be prepared to pay, on behalf of your household, as a once-only payment (to be collected in your Council rates) to ensure that the monument was not sold: \$ \_\_\_\_\_
- 55 If, instead, there were two very similar war memorials, with the other one being very nearby to this one, how much would you now pay to retain this one in its location: \$ \_\_\_\_\_
- 56 How many similar war memorials would have to be in the local area before you would allow this one to be sold to the developer for the market price: \_\_\_\_\_
- 57 If the local Council approached you to nominate a once-only levy, payable by each household (and passed on to tenants by their landlords where applicable), to enable the monument to be retained in its present location, what amount would you recommend: \$ \_\_\_\_\_
- 58 If, instead, there were two similar memorials, what amount would you now recommend to Council as a once-only payment by all local households to avoid the sale of the one in question: \$ \_\_\_\_\_
- 59 Council has decided that instead of collecting a once-only payment for the retention and maintenance of the monument, it will levy all households on an annual basis. It has asked you to nominate the figure to be levied: \$ \_\_\_\_\_ per year
- 60 Council has decided to allow the developer to pay a compensation amount directly to each household in the local Government area for the right to acquire the monument. How much would you expect to be given to compensate for your loss: \$ \_\_\_\_\_
- 61 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Unfortunately, the particular war memorial is built directly on top of critical communication cabling and information network systems infrastructure that is essential to the needs of the local ambulance service. For this reason, there is little alternative other than to move the monument to another location or have the ambulance service pay for very expensive re-cabling. The ambulance service has a reserve fund to enable it to pay for such contingencies as the monument removal, but there is not enough in the fund to pay for the expensive re-cabling.

62 Do you think that the monument should be moved under these circumstances:

☐ No ☐ Yes (please tick)

63 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

64 What amount should the ambulance service be prepared to pay (via a Council controlled fund dedicated to community enhancing activities), in addition to the cost of removal, to compensate the people of the local community for the removal of the monument from its existing site: \$ \_\_\_\_\_

65 To enable the monument to remain untouched, how much would your household be prepared to pay (in the form of a once-only rates levy) to assist with paying for the re-cabling: \$ \_\_\_\_\_

66 If, instead, there was a similar memorial to the one in question in the near vicinity, and the other will remain untouched by the cabling work, how much would you now pay to retain the monument in its present location: \$ \_\_\_\_\_

67 How many similar memorials would have to exist in the local area before you simply let the ambulance service remove the one in question to another near-by location: \_\_\_\_\_

68 If the local Council asked you to nominate a once-only levy, payable by each household, to assist with paying for the re-cabling, what amount would you recommend: \$ \_\_\_\_\_

69 If, instead, another similar memorial exists near-by, and the other will remain untouched by the re-cabling work, what once-only levy would you now recommend to Council:

\$ \_\_\_\_\_

70 Comments: \_\_\_\_\_  
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\_\_\_\_\_

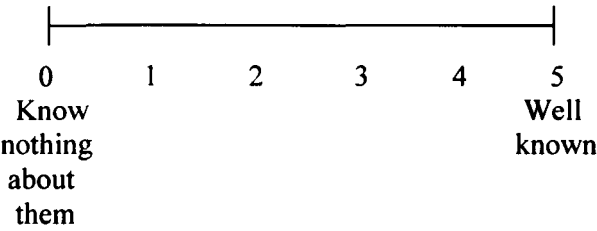
The Macquarie Marshes form an important wetland around the Macquarie River in north-west New South Wales. Their importance is many-faceted, but chief amongst these is that the Marshes provide a significant habitat for waterbirds and an array of exotic wildlife, and in addition, the area is extensively developed for irrigated agriculture.

The Marshes were originally the largest wetlands in New South Wales, with an area of 5000km<sup>2</sup>. In 1967 Burrendong Dam near Wellington was opened on the upper Macquarie River and a large area of irrigated agriculture has developed throughout the Valley as a result. The Burrendong Dam is also fed by flows from the Windamere Dam situated close to Mudgee. Irrigated agriculture directly employs around 4400 people in the greater Macquarie Valley and is a significant source of rural income for many farming families.

Since 1967, the area of the Marshes has reduced to from 5000km<sup>2</sup> to around 1000km<sup>2</sup> and the frequency of waterbird breeding events has fallen from every year to every fourth year on average.

Additionally, the number of endangered species using the wetlands has fallen from 34 to 12. There are now three broad options available for the management of the Macquarie Marshes: to continue the current situation, to further increase water for the wetlands, or to increase water for irrigation.

71 Please indicate your degree of familiarity with the Macquarie Marshes:  
(place a tick on the line)



72 Should the area of the Marshes be allowed to expand even if it costs jobs:

☐ No ☐ Yes (please tick)

In summary, the current Macquarie Marshes scenario is:

Wetland area: 1000km<sup>2</sup>

Waterbird breeding events every 4 years on average

Endangered and protected species present: 12

Irrigation related employment in the Valley: 4400 jobs

73 What amount would you pay, on behalf of your household, on a once-only levy basis to achieve the following result (the money would be used to buy commercial irrigation licenses, so that the current holders were paid a fair market price in compensation for them): \$ \_\_\_\_\_

Wetland area increases to 1400km<sup>2</sup>

The frequency of waterbird breeding increases to every three years

The number of endangered and protected species increases to 16

Irrigation related employment remains unchanged



74 What amount would you pay, on behalf of your household, on a once-only levy basis to achieve the following result: \$ \_\_\_\_\_

Wetland area increases to 1400km<sup>2</sup>

The frequency of waterbird breeding increases to every three years

The number of endangered and protected species increases to 16

Irrigation related employment falls by 100

75 What amount would you pay, on behalf of your household, on a once-only levy basis to achieve the following result: \$ \_\_\_\_\_

Wetland area increases to 1800km<sup>2</sup>

The frequency of waterbird breeding increases to every two years

The number of endangered and protected species increases to 20

Irrigation related employment remains unchanged

76 What amount would you pay, on behalf of your household, on a once-only levy basis to achieve the following result: \$ \_\_\_\_\_

Wetland area increases to 1800km<sup>2</sup>

The frequency of waterbird breeding increases to every two years

The number of endangered and protected species increases to 20

Irrigation related employment falls by 150 jobs

77 Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Assume that instead of the current scenario mentioned previously, the current Macquarie Marshes scenario is:

Wetland area: 1800km<sup>2</sup>

Frequency of waterbird breeding: every 2 years

Number of endangered and protected species present: 20

Irrigation related employment: 4250 jobs

If all of the available irrigation licenses in the Valley were brought into use, the likely scenario would change to :

Wetland area reduces to 1000km<sup>2</sup>

The frequency of waterbird breeding reduces to every 4 years

The number of endangered and protected species reduces to 12

Irrigation related employment increases to 4400 jobs

78 There are some losses and some gains associated with this change. Do you think that the broader community (say, the State) should receive some form of compensation from the water users for these changes (with the proceeds to be used on other environmental projects):

☐ No ☐ Yes (please tick)

79 Regardless of how it is paid, what do you consider is a reasonable amount of compensation due to the people of New South Wales in return for allowing this scenario to generate: \$ \_\_\_\_\_

80 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Throughout this series of exercises so far you have been considering various cases in which you have been asked to nominate an amount that you think would represent a reasonable level of compensation to your the community for the loss or destruction of an asset. For example, loss of the dialysis machine and loss of the historic building.

81 Assume you have the local community’s full support as their chief negotiator, and they allow you to use your opinion as to the amount of compensation due to the community for the loss of the particular asset. Generally speaking, would you be willing to come to a compromise about the amount of compensation due (the alternative is that you would be totally unwilling to compromise on the figure you first nominated):

☐ No                      ☐ Yes            (please tick)

82 If you answered ‘no’ to the previous question you do not need to answer this question. If you answered ‘yes’, generally speaking, what amount would you be willing to compromise by, and still remain satisfied that you had achieved a reasonable outcome:  
(please tick one box)

☐ 5%            ☐ 10%            ☐ 15%            ☐ 20%            ☐ 25%

83 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Take a few moments to consider the following description of the difference between a 'consumer' and a 'citizen':

"As a consumer, I concern myself with my personal or self-interested wants and interests; I pursue the goals I have as an individual. I put aside any community-regarding principles, and I look out for my own benefits.

As a citizen, I am concerned with the public interest, rather than just my own interest; with the good of the community rather than just my personal well-being. This may include giving due consideration to people outside my local sphere and possibly include the interests of future generations."

With this definition in mind, the following questions are repeats of some of the questions already answered by you. You are now asked to consider what answer you would give assuming you adopt a citizen-oriented role.

The Federal Government has decided to enable the people of Australia to build up a 'fighting fund' to be used for the public purchase of environmentally sensitive sites when/if they become a target for significant impacts such as mining or demolition. Acquisition would allow the sites to be purchased and maintained in their present condition. The fund is to be built up from an annual taxation impost, of a reduction in welfare payments.

- 84 What is the maximum increase in tax, or reduction in welfare benefit, for one year only, that you would be prepared to accept on behalf of your household, to support such a fund:

\$ \_\_\_\_\_

- 85 What is the maximum increase in tax, or reduction in welfare benefit, that you would be prepared to accept on behalf of your household, on the basis that it remains as a levy for an indefinite period (similar to the Medicare levy):

\$ \_\_\_\_\_ per year

86 Comments:

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There has been a reasonably dramatic increase in the number of cases of kidney disorders in the local government area recently and an extra dialysis machine is required by the local hospital. Patients are still able to make use of the dialysis resources at \_\_\_\_\_ (next major hospital), but it will entail a significant amount of travelling on a regular basis. Of course, this may become a problem in the case of an emergency situation. The State Government recognises the need for the hospital to have the new machine, but it will only contribute a small portion of the funds at present although it may have the funds available in a few years.

87 If you, on behalf of your household, were asked to make a once-only contribution, how much would you be prepared to give: \$ \_\_\_\_\_

88 If, instead, the hospital has decided to lease the machine over an extended (indefinite) period,

how much would you be prepared to commit to each year (the amount would be added to annual Council rates): \$ \_\_\_\_\_ per year

89 Regardless of the cost of the machine, local Council has asked you to recommend an amount that each household will be levied on a once-only basis to assist in paying for the machine.

What is your recommendation: \$ \_\_\_\_\_

90 Alternatively, Council has decided a continuing annual levy will be charged to all households in the local Government area to assist with paying for the machine over an extended period. What amount would you recommend be charged: \$ \_\_\_\_\_ per year

91 Comments:

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A property developer has confirmed his intentions to buy the historic property shown previously, and to then demolish the structure so that he can construct a new building on the site. The current estimated market value of the property is \$ \_\_\_\_\_ (to be provided by the moderator). This is composed of land value \$ \_\_\_\_\_ plus separate value of the building \$ \_\_\_\_\_.

92 If local the Council was in a position to charge the developer an amount in addition to the purchase price to fully compensate the community for the loss of the building, how much do you think they should charge (assume that any additional charge paid by the purchaser is directed by Council for community enhancing activities such as welfare support, cultural activities, provision of health or educational facilities, or construction of community-benefiting facilities): \$ \_\_\_\_\_

93 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

You have now listened to two sides of the debate about issues concerning the Macquarie Valley. Several of the questions presented to you previously relating to the Macquarie Marshes are repeated below for your re-consideration.

94 Should the area of the Marshes be allowed to expand even if it costs jobs:

☐ No ☐ Yes (please tick)

In summary, the current Macquarie Marshes scenario is:

Wetland area: 1000km<sup>2</sup>

Waterbird breeding events every 4 years on average

Endangered and protected species present: 12

Irrigation related employment in the Valley: 4400 jobs

95 What amount would you pay, on behalf of your household, on a once-only levy basis to achieve the following result (the money would be used to buy commercial irrigation licenses, so that the current holders were paid a fair market price in compensation for them): \$ \_\_\_\_\_

Wetland area increases to 1400km<sup>2</sup>

The frequency of waterbird breeding increases to every three years

The number of endangered and protected species increases to 16

Irrigation related employment remains unchanged

96 What amount would you pay, on behalf of your household, on a once-only levy basis to achieve the following result: \$ \_\_\_\_\_

Wetland area increases to 1400km<sup>2</sup>

The frequency of waterbird breeding increases to every three years

The number of endangered and protected species increases to 16

Irrigation related employment falls by 100

97 What amount would you pay, on behalf of your household, on a once-only levy basis to achieve the following result: \$ \_\_\_\_\_

Wetland area increases to 1800km<sup>2</sup>

The frequency of waterbird breeding increases to every two years

The number of endangered and protected species increases to 20

Irrigation related employment remains unchanged

98 What amount would you pay, on behalf of your household, on a once-only levy basis to achieve the following result: \$ \_\_\_\_\_

Wetland area increases to 1800km<sup>2</sup>

The frequency of waterbird breeding increases to every two years

The number of endangered and protected species increases to 20

Irrigation related employment falls by 150 jobs

99 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Assume that instead of the current scenario mentioned previously, the current Macquarie Marshes scenario is:

Wetland area: 1800km<sup>2</sup>

Frequency of waterbird breeding: every 2 years

Number of endangered and protected species present: 20

Irrigation related employment: 4250 jobs

If all of the available irrigation licenses in the Valley were brought into use, the likely scenario would change to :

Wetland area reduces to 1000km<sup>2</sup>

The frequency of waterbird breeding reduces to every 4 years

The number of endangered and protected species reduces to 12

Irrigation related employment increases to 4400 jobs

100 There are some losses and some gains associated with this change. Do you think that the broader community (say, the State) should receive some form of compensation from the water users for these changes (with the proceeds to be used on other environmental projects):

☐ No

☐ Yes

(please tick)

101 Regardless of how it is paid, what do you consider is a reasonable amount of compensation due to the people of New South Wales in return for allowing this scenario to generate: \$ \_\_\_\_\_

102 Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The following questions relate to the values jury process and your opinion on its benefits.

You were invited to attend today’s jury exercise via a random mail-out to members of the local community:

103 Would you have attended today if there was no payment made to you for your attendance:

☐ No ☐ Yes (please tick)

104 If you answered ‘no’ to the previous question, what is the minimum payment you would have accepted to attend for the same period (if you answered ‘yes’ please go to the next question): \$ \_\_\_\_\_

105 If the jury was extended to 2 days with the \$80 payment to you applicable to each day, could you still have attend:

☐ No ☐ Yes (please tick)

106 Do you have any comments about how the jury process could be improved: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

107 Do you consider that there was adequate opportunity to ask questions and criticise the  
claims of the guest speakers:

\_\_\_\_\_ (place tick on line)

0 1 2 3 4 5

No Yes

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

108 Are you confident that you understood all of the terms and expressions used by the  
speakers :

(place tick on line)

No 0 1 2 3 4 5 Yes

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

109 Do you think that the speakers gave clear definitions of any terminology  
they used from the commencement of their presentations:

\_\_\_\_\_ (place tick on line)

0 1 2 3 4 5

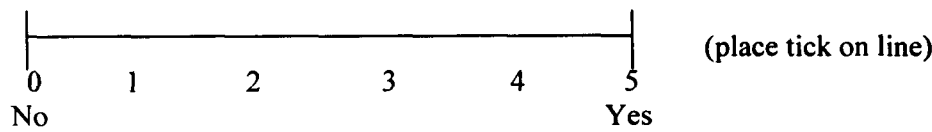
No Yes

Comments: \_\_\_\_\_

\_\_\_\_\_

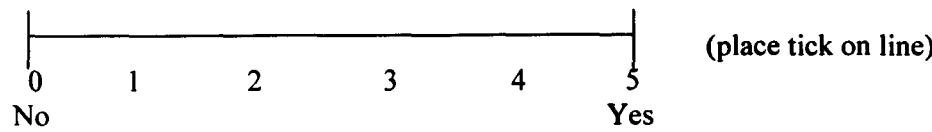
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110 Do you think that the speakers appreciated what level to aim their presentations at to suit the mixed audience:



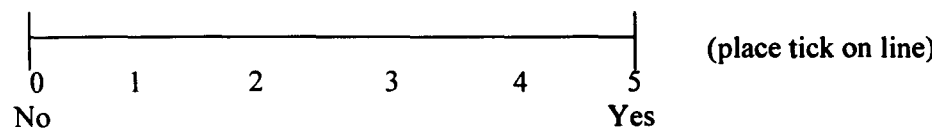
Comments: \_\_\_\_\_  
\_\_\_\_\_  
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111 Do you think that the speakers attempted to clearly resolve any issues about definitions and terms they used that may have been unclear to the audience:



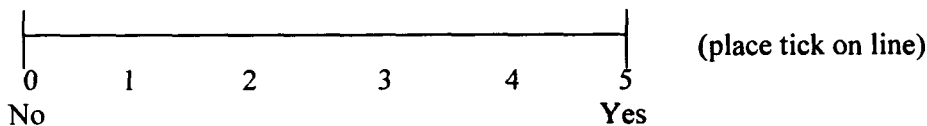
Comments: \_\_\_\_\_  
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\_\_\_\_\_

112 Do you think that the speakers provided adequate evidence to support their claims (so as to avoid just emotional claims):



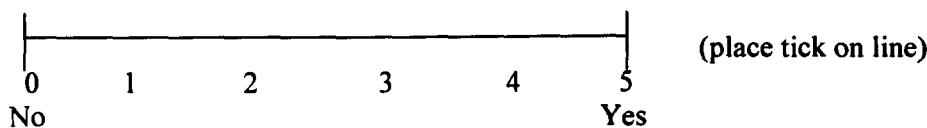
Comments: \_\_\_\_\_  
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\_\_\_\_\_

113 If other experts in the irrigation and conservation fields had listened to the guest presentations, do you think they would have found them credible:



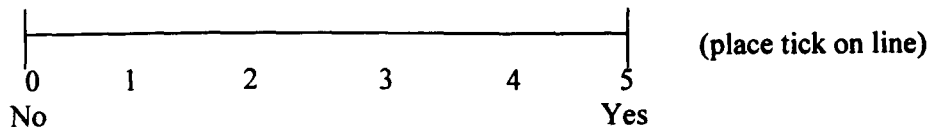
Comments: \_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_

114 Do you think that the speakers clearly identified how the issues ‘are’ rather than just how they ‘should be’:



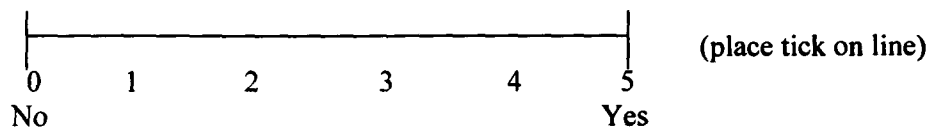
Comments: \_\_\_\_\_  
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115 Do you think that the jury process is a reliable means to developing an understanding and appreciation of the topic in question (so that the final jury verdict is considered a reliable reflection of your community’s opinion about any particular topic):



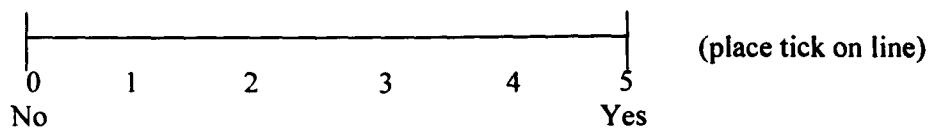
Comments: \_\_\_\_\_  
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116 Do you think that the jury process allows for a satisfactory level of dialogue (discussion) between the speakers and the jury members:



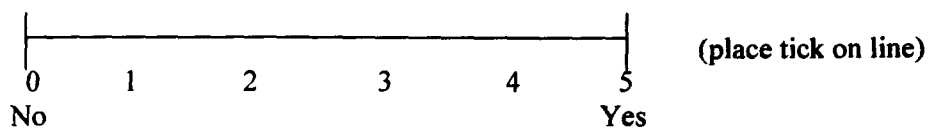
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

117 Do you think that the jury process is a fair and satisfactory way of determining the general will of the local community:



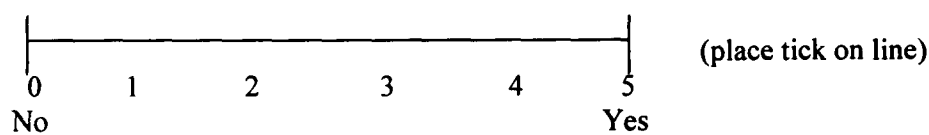
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

118 Did the guest speakers demonstrate a sincerity in belief about their topic:



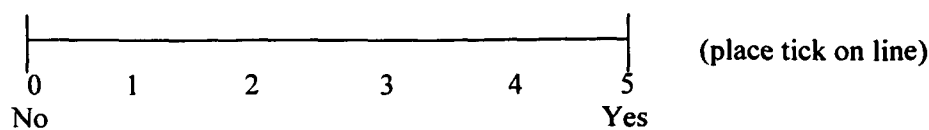
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

119 Do you think that the jury process allowed a useful description of some of the fundamental issue relating to the Macquarie Valley and the Macquarie Marshes to be examined:



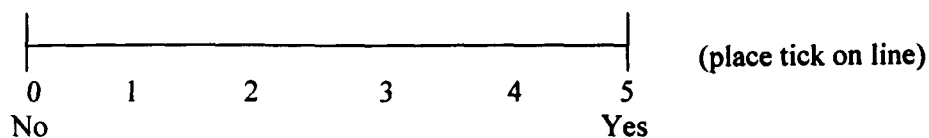
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

120 Do you think that the time allocated for the speakers and general discussion was adequate to enable you to provide a generally informed answer to the value-related questions you were asked to answer after the presentations:



Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

121 As a result of the presentations, did you change your opinion about the significance of the topic:



Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_