The Australian Journal of Agricultural and Resource Economics, 51, pp. 353–357

Book reviews

Cost-Benefit Analysis and Water Resources Management, edited by Roy Brouwer and David Pearce. Published by Edward Elgar, Cheltenham, UK, 2005, pp. xxiii + 404, ISBN 1 84376 359 1 (hdbk), $US121.50.

There is an increasing momentum in water resource economics to measure the full economic value of water in its various competing uses. *Cost-Benefit Analysis and Water Resource Management* is a timely, policy-relevant contribution towards this growing body of work. The editors have aimed to provide an overview of how economic values of water can be measured and incorporated in policy and project appraisal. In particular, the case studies concentrate on approaches for valuing water when market prices cannot the case studies concentrate on approaches for valuing be directly observed from efficient commodity markets.

The book is organised into three related parts. The first chapter provides a general introduction. Section Two (chapters 2 and 3) outlines the (neoclassical) economic foundations of non-market water valuation and the welfare foundations of cost benefit analysis. Section Three is dedicated to 15 country specific case studies covering flood control investment and policies (chapters 4 and 5); river restoration and basin management (chapters 6 and 7); surface water quality (chapters 8 through 12); groundwater quality and remediation (chapter 13); water allocation decision support (chapters 14 and 15); and urban water supply (chapter 16). The material in the book is accessible to generalist and non-technical readers. In particular, the material will be of use to readers involved in water resource policy, planning, regulation and investment.

Robert Young's chapter (chapter 2), outlining the conceptual foundations for non-market economic valuation and allocation criteria, is particularly valuable in establishing the requisite framework for the case studies subsequently presented. The author emphasises the role of temporal, spatial and quality dimensions as determinants of water value at site and at source. The need to ensure commensurability in comparative water valuation is also emphasised. Basic models for evaluating water supply investments and water reallocation between sectors are presented, with the intersector decision model recognising the impact of transaction costs. Uncertainty and sensitivity analysis also receive a brief introductory treatment.

Lacking from the foundation chapters is a general discussion of the stages involved in a cost benefit analysis. While this framework is subsequently and briefly presented in chapter 5, readers lacking previous exposure to the cost benefit analysis approach would benefit from an earlier presentation of this material. The foundation chapters could have also benefited from a more

doi: 10.1111/j.1467-8489.2007.00387.x

detailed discussion of the revealed and stated preference approaches for valuing non-marketed goods, given these methods are the central focus of the majority of the case studies in the book. Making a distinction between use and non-use resource values based on weak complementary would have served to further develop this discussion and highlight the fact that revealed preference approaches cannot be employed to evaluate non-use values.

The strength of the case studies lies in the breadth of issues addressed, the variety of management approaches adopted, the interdisciplinarian research focus adopted in the majority of studies and the range of valuation methods applied. In this sense, the book serves as a practical and useful guide to applied water resource valuation and cost benefit analysis in a wide variety of contexts. Stand-out case studies in the book include Brouwer and Bronda's cost benefit analysis of improving bathing water quality in the Netherlands (chapter 11), Rinaudo and Loubier's cost benefit analysis of large scale groundwater remediation in France (chapter 13) and Groom, Koundouri and Swanson's cost benefit analysis of water allocation in Cyprus (chapter 14). The common characteristic of each these studies is that systems approaches of different levels of complexity are used to model interdependencies between a hydrodynamic system and multisector welfare outcomes. Water resources are evolving systems normally characterised by complex dynamic interactions between often ill-defined variables operating at a range of spatial and temporal scales. Systems modelling can assist in predicting the broader effects of water resource system perturbations and the cascade effects of these perturbations on other water dependent systems. Approaches that do not adopt a systems perspective are likely to under-define the effects of policy changes on water resource and water-dependent systems, and therefore misstate the benefits of a program or policy.

The case studies also serve to highlight the array of methodological and practical challenges associated with undertaking water resource valuation research. It is worth focusing on two issues in order to highlight some of the more important and largely unresolved challenges faced in several of the case studies.

The first challenge is value aggregation. Modelling distance decay effects is one approach that can be used to account for the geographical extent of a market for specific water resource goods and services. Both intuition and previous research suggests the relationship is generally inverse, particularly in the case of extractive and non-extractive use values, such as recreational use and amenity values. Where distance decay effects exist, aggregation accounting for this effect will normally result in lower aggregate values than an approach that does not explicitly model these relationships. The importance of accounting for potential distance decay effects is highlighted by four case studies in the book that *do not* perform this analysis. The aggregate values derived given this assumption are in all cases large contributors to each of the case study's total benefits. In some cases, these benefits are decisive in making the proposed policy alternative pass the Hicks–Kaldor compensation test. It is possible,

however, that if distance decay effects were accounted for, aggregate program benefits would be smaller and the compensation test may not be passed.

The second challenge faced by several case studies relates to the use of benefit transfer. The key requirements for a valid benefit transfer, noted on page 144, are: (i) baseline similarity of the study areas; (ii) a comparable set of benefits derived from the natural assets; and (iii) a comparable affected population. It is not clear whether these conditions are met by all the case studies in this volume that employ benefit transfer. While each of the studies employing benefit transfer explicitly recognises the difficulty and uncertainty of using the approach, noting caveats is insufficient. The question that must be directly answered is whether some number is better than no number at all. If this question cannot be answered definitively and affirmatively, a more conservative approach would be not to assign values to these benefits.

In summary, however, the editors of *Cost Benefit Analysis and Water Resource Management* present a valuable, broadly rigorous and timely contribution to the evolving literature on non-market valuation of water resources in particular, and interdisciplinary water resource management and policy more generally. The contributions highlight the challenges posed for non-market valuation of water resources and the many uncertainties inherent in this process. In the end, the value of cost benefit analysis in water resource management is perhaps best emphasised by Brouwer and Kind's observation (chapter 5) that cost benefit analysis, because of its uncertainties, should not be considered as the final answer. Rather, economic valuation and CBA should be viewed as 'experiments testing the robustness of a project to alternative assumptions regarding the costs and benefits'. The cost benefit analysis process should also be correctly viewed as an opportunity for interdisciplinary collaboration towards the objective of integrated policy decision-making.

JEREMY CHEESMAN
PhD candidate
The Crawford School of Economics and Government
The Australian National University

Australia's Water Resources: From Use to Management, by John Pigram. Published by CSIRO Publishing, Collingwood, Australia, 2006, pp. 240, ISBN 0643093370 (hdbk), $89.95.

John Pigram wrote his first paper on water economics in 1972 and has worked in this field ever since. This included a stint for over 14 years (1987–2001) as Director of UNE's Centre for Water Policy Research. 'Australia's Water Resources' is the most informative book about Australia's water resources that I have read. In a policy relevant manner, Pigram accurately summarises what a policy analyst needs to know about the way that Australia's

water resource systems are configured, used and managed. This is not a book about policy options and choice. Instead, Pigram has attempted and succeeded in summarising what any aspiring specialist in Australian water policy needs to know.

System coverage is wide. There is an excellent description of Australia as a wet and as a dry continent. Unlike many, Pigram has been around long enough to write informatively about flood, as well as, drought management.

The book also contains short but useful sections on the northern development which could save those interested in this part of Australia a lot of time. Among many things, Pigram observes that 'the Ord River Project represents the testing ground for determining economic viability of intensive agricultural production in northern Australia. Large quantities of uncommitted water and large areas of land suitable for development are available. However, it appears that there are limited opportunities for economic utilisation of these resources. This makes it easier to understand the exaggerated optimism of politicians . . .' (p. 55).

One can also find brief summaries of the Bradfield Plan, proposals to divert the Clarence inland and Ernie Bridges' National Water Distribution Scheme. Usefully, each is summarised with a map and a brief description that makes it abundantly clear that the economics of such schemes do not yet add up.

The Murray Darling Basin Agreement and urban water management in Australia are described with equal clarity and brevity. Sydney's and Melbourne's water supply systems are described in around two pages and a few maps and diagrams. The coverage is just sufficient to allow one to understand how each system is managed, what the policy issues are and why they have arisen. These sections are followed by a short discussion about alternative urban water sources – sewage re-use, rainwater harvesting, stormwater capture and desalination. Surprisingly, there is no discussion about opportunities to purchase water for urban purposes from agricultural sources. Pigram concludes that 'Desalination is not *the* option to solve problems of water scarcity, it is *one* of the options' (p. 103).

One of the characteristics of Pigram's book that stands out is the inclusive attention to all the dimensions of Australia's fresh water resources. The chapters on the role of water in recreation and tourism and, also, in mining are really informative. These areas are ripe for policy analysis.

'*Australia's Water Resources: From Use to Management*' is not a book about policy choices, but provides the underlying structure and detail of water resources and use that are essential prerequisites to understanding policy options. John Pigram set out to tell people about the resources that have been the focus on his attention for well over 30 years. My recommendation is that any person wishing to engage in national debates about water management should read this book. Why? Simply because it provides a brilliant nation-wide synthesis of the way Australian water resources are used, have been allocated and are being managed. It is a source book that will save many a lot of time. What's missing? A section or two on estuaries and a bit

more on groundwater extraction and ground-surface water connectivity would have been nice additions.

MIKE YOUNG
Research Chair
Water Economics and Management
The University of Adelaide