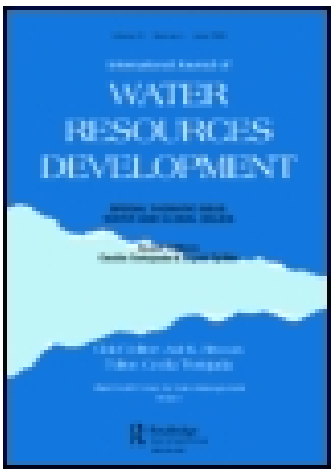

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Book Reviews

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Book Reviews

Classic Papers in Natural Resource Economics
Edited by Chennat Gopalakrishnan
Basingstoke, Macmillan, 2000 and New York, St Martin's Press, 2000, 348 pp.

Chennat Gopalakrishnan has skilfully assembled a collection of classic papers in natural resource economics. These represent seminal contributions of distinguished economists over the last seven decades (1930–2000). The various resource concepts discussed in these articles are quite germane to an entire constituency of water resource professionals and practitioners, including hydrologists, economists, institutionalists, environmentalists, conservationists, governmental agencies, non-governmental organizations, lawyers, managers and policy planners. The scope of the book is wide-ranging and its appeal equally quite broad.

Each of the 14 papers included in the book serves to facilitate, broaden and deepen understanding of complex issues in natural resource economics. Logical sequencing of subject areas and topics allows readers to gain insights into many issues related to resource production, pricing, consumption and allocation.

The editorial job is a masterpiece. The five parts of the book have been woven together with extraordinary coherence and connectivity. These deal with the intertemporal problem, externalities and market failure, property rights, institutions and public choice, the economics of exhaustible resources and the economics of renewable resources.

The concepts discussed by the galaxy of writers in the field lend themselves to discussions on the economics of water use and water resources development in any part of the world. This book used as a supplementary text in any graduate course would serve to strengthen the training of any aspiring water resource or environmental economist. Indeed no part of it can be omitted. Likewise, water policy analysts, planners and practitioners in the field would reap a rich harvest from reading the book even if they were to skip over the occasional difficult formulae and equations in some of the more technical chapters. In the next few paragraphs pointed references are made to the applicability of the various concepts in the book to issues related to current and continuing problems of water resources development.

In the first section on the intertemporal problem are included papers by Feldstein and Baumol, and joint papers by Arrow and Lind as well as by Arrow and Fisher. The first two papers help the reader to understand the complexities in choosing an appropriate social discount rate in cost–benefit analysis of projects and the intricacies involved in the evaluation of public investment decisions. Thomas Schelling (1997), for example, has raised a question on greenhouse climate issues. He asks whether three or four generations from now, the society would not benefit more from investing directly in public health,

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education, water resources, infrastructure, industry and family planning in developing countries rather than benefits associated with obtaining reduced climate changes. He also wonders whether in doing so benefits would not accrue earlier to people who more desperately needed them. He does not think that the greenhouse gas problem could be treated in isolation from the developing world's economic needs. These are the types of intertemporal and intergenerational issues and queries for which the reader may find guidance from Chapters 1 and 2 of the book. Also Davis (1968) in his book on *The Range of Choice in Water Management* talks about economic, institutional and political uncertainty in dealing with the issue of dissolved oxygen in the Potomac estuary. But rather than assume them away, as was done in the study, a reading of this section of the book would illumine the reader that time- and risk-preferences relevant for government decisions should be developed as a matter of national policy as suggested by Arrow and Lind in Chapter 3. In Chapter 4, Arrow and Fisher elaborate on the uncertainty associated with economic estimates of the environmental costs of development activities. For example, in dam construction, such as the one to develop hydroelectric capacity in the Hells Canyon reach of the Snake River, these estimates could be associated with environmental amenities like wilderness areas and scenic resources, *in situ* resources, whose development would invariably result in an irreversible alteration. In such a situation, the comparative economics of preservation versus development is made difficult by the uncertainty associated with estimates of environmental costs. As a result, the authors conclude that the net benefits would be lower for development, and thus the rule of thumb, in general, would be to develop less of the area.

Section 2 of the book deals with externalities and market failure. This is a section crucial to the economics of water use. Very 'thin' markets for water transfers and the presence of myriad externalities in riparian uses make this section with articles by Coase (Chapter 5), Buchanan and Stubblebine (Chapter 6) and Turvey (Chapter 7) a very important one. 'Water markets in theory and practice' by Saliba and Bush (1987) and a more recent article on the 'Economic incentives for water conservation on the Monterey peninsula: the market proposal' by Agthe and Billings (2000) highlight the significance of many of the concepts discussed in this section of the book. Public interest and public welfare in many states, for example, could also affect water transfer rights as they may impact on groundwater recharge, alternative allocations of water and water quality.

The third section deals with property rights, institutions and public choice. Chapter 8 is a classic on the theory of property rights by Demsetz and Chapter 9 presents the economic theory of a common property resource by Gordon. A comprehensive knowledge of property rights in water, which for the most part are usufructuary, helps in understanding water use rates, water allocation and communal water storage problems. A National Research Council (1992) publication on *Water Transfers in the West: Efficiency, Equity and the Environment* alludes, for example, to the transferability of such property rights. The paper by Buchanan on 'Politics, policy and the Pigovian margin' (Chapter 10) can help a policy analyst develop a balanced perspective on water management and water conservation issues. Indeed, books such as by Wahl (1989) on *Markets for Federal Water: Subsidies, Property Rights and the Bureau of Reclamation* and the book *Thirst for Growth: Water Agencies as Hidden Government in California* by Gottlieb and Fitzsimmons (1991) point to the very imperfections that (Buchanan says) arise

from the political attempts at applying the economist's efficiency criteria. This section will therefore be of great interest to welfare economists and economists in general. It is also useful reading for those dealing with water conservation and management as they develop appropriate water rate structures and promote conjunctive use of ground and surface waters.

A discussion on the economics of exhaustible resources is the focus of the fourth section of the book. Chapter 11 by Hotelling and Chapter 12 by Solow discuss, among other things, probable patterns of exploitation of a resource subject to exhaustion. They also shed some light on the question as to what part of the proceeds should be regarded as income and what part should be seen as return on capital in exploiting such a resource. Since hydropower competes with exhaustible fuels such as coal and oil, the insights gained from these chapters can help one grasp the significance of ambitious national water projects such as the Three Gorges dam on the Yangtze, the Narmada dam in India and the Lesotho Highlands project in the Senqu River basin either to reduce oil dependence or to develop a viable export. Thus, this section can also be useful for water planning.

The fifth and last section of the book deals with the economics of renewable resources. While fisheries are dealt with by Smith in Chapter 13, the economics of forestry in an evolving society is the theme of Chapter 14 by Samuelson. By reading these chapters, officials of water planning agencies can see how water development activities can considerably influence the use and extraction rates of both of these resources. Clearly, water development can impact ecological habitats and siltation rates and thus affect productivity of these renewable resources. This clearly has implications for water sports, recreation, camping and fishing activities as well as flood control. In the book by Hundley (2001), *The Great Thirst: California and Water—A History*, it is noted, for instance, that environmentalists who advocate conservation of many types of renewable resources are becoming major players in water decision making.

The introductory essay written by Gopalakrishnan is another major selling point. In superb writing style he provides a compelling survey and synthesis of classic papers included in the volume. Clearly, this book is a must-have for every serious scholar of natural resource economics. For where else can one find such a convenient bundle of the writings of luminaries in the field?

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Prahlad Kasturi
Professor of Economics
Radford University, Virginia, USA

Investing in Water Quality: Measuring Benefits, Costs and Risks
Clifford S. Russell, William J. Vaughan, Christopher D. Clark, Diego J. Rodriguez & Arthur H. Darling
Washington, DC, Inter-American Development Bank, 2001, US$29.95, 333 pp.

This is a very well written, very well documented book dealing with the importance of water quality management in developing countries and illustrating how socially responsible design and evaluation of ambient water quality projects can be carried out. The book is based on the extensive experience of the Inter-American Development Bank in Latin America and original thinking on the part of the highly experienced authors.

The authors espouse a river-basin approach to water quality planning and programme evaluation, noting that project analysis has too often been of narrow geographical scope, limited to consideration of only a single project. It is acknowledged that full-blown benefit–cost analysis of ambient water quality programmes at the river basin level is often not feasible and that it may be necessary to settle for minimizing the cost of meeting prescribed standards, provided the standards make sense in the developing country context and do not simply mimic those of advanced countries. The authors suggest that the more important projects identified in the cost–minimizing process might then be individually subjected to fuller benefit-cost assessments. In spite of the suggested partial benefit-cost approach, a major argument is that benefit assessment is especially important to countries with limited resources to devote to quality management. The book exhibits through case studies methods for benefit evaluation, emphasizing contingent valuation as a major approach. In fact, the major part of the book is devoted to contingent valuation procedures, including the complexities of using the 'referendum' approach to queries recommended by the National Oceanic and Atmospheric Administration (NOAA) 'Blue Ribbon Panel'. If, indeed, we were compelled to follow the set of recommendations made by that Panel, contingent valuation would be ruled out in most developing country applications. Some additional practical guidance on selection of alternative contingent valuation method procedures would have been useful.

The book emphasizes the importance of uncertainty involved in the quantification of costs, benefits, the functioning of infrastructure, hydrology, etc. and suggests a Monte Carlo procedure to permit simultaneous treatment of multiple uncertainties at the project level. This then results in probability distributions of relevant measures: net present value, the benefit–cost ratio or physical measures of project performance. A case study illustrates a situation in which benefit uncertainties are the most important source of overall uncertainty,

but it is not clear that this is generally the case, given the worldwide history of cost under-estimation on water projects of all kinds. The case is well made, however, that the Monte Carlo procedure has advantages over the more usual sensitivity analyses under which individual parameters are varied by arbitrary amounts.

The book presents (Chapter 5) a useful if not exhaustive survey of water quality models and a clear presentation of the various classes of benefits that may be relevant (total value, use values, non-use values, etc. in Chapter 6). Chapter 4 ("Temptations, Pitfalls and Technical Complications") raises important issues, some of which are not really resolved among economists. The authors come down hard on counting "secondary benefits and costs" that are forward- or backward-linked to the project itself. While there has been widespread abuse of secondary impacts in project assessment, where resource mobility is limited and information incomplete, the creation of employment or unemployment of human resources and fungible capital becomes relevant from an economic efficiency viewpoint.

In sum, the book pulls together many issues and tools and is a worthwhile reference for practitioners and theorists alike. While one may harbour reservations about the use of contingent valuation system in a Third World setting, the study presents innovative but practical approaches to the design and evaluation of ambient water quality programmes. Its vocabulary involves advanced terms in both economics and hydrology, so a beginner might find it a bit tough going but overall it is a 'good read'.

Charles W. Howe
Departments of Economics
University of Colorado
Boulder, Colorado