G. A. Carlson, D. Zilberman, and J. A. Miranowski (editors) *Agricultural and Environmental Resource Economics*

Oxford University Press, Oxford, 1993. ISBN 0 19 507651 6. 528 pp. Price: £35

'*Man is a complex being; he makes deserts bloom, and lakes die.*'

This citation by Gil Stern leads off a chapter on the economics of water use in agriculture in *Agricultural and Environmental Resource Economics* by Carlson, Zilberman and Miranowski. 'It captures in a single sentence the complexity and impact of the issues associated with agricultural water use' (p. 319). The book also focusses on the case-specific complexities of the agricultural utilisation of natural resources besides water and gives a taste of how difficult it is to write a comprehensive and integrated book on agricultural and environmental resource economics.

The book has been planned and written by the Consortium for Integrated Crop Productions Systems (a group of 14 individuals from US universities), Resources for the Future, and the US Department of Agriculture. It is geared towards the discipline, as nearly all authors use economic jargon and geometric figures. Although the different types of mathematical models are explained briefly, it is helpful to be familiar with static and dynamic optimisation models subject to equality and inequality constraints. The authors also assume knowledge of micro-economic theory and welfare economics.

Agricultural and Environmental Resource Economics is a collection of chapters which covers the broad field of resource economics and which can be divided into five sections: (1) introduction and overview; (2) analytical models and concepts common to all areas of agricultural resource economics; (3) applications of analytical models to address economic issues related to specific agricultural resources; (4) analysis of agricultural resource policy; and (5) prospective resource issues in world agriculture.

In the first section, Miranowski and Carlson argue for the importance of agricultural resource economics and describe the history of, and incentives for, agricultural resource use. This initial chapter also supplies an overview of ten chapters to come and explains the links between these chapters and the general theme of the book.

The second section is a potpourri of six chapters designed to develop and discuss the aggregated and micro-level models employed in the economics of renewable and non-renewable resources, the concept of externalities, and technological innovations. In chapter 2, Howitt and Taylor provide a classical outline of micro-economic theory applied to agricultural resource use. This analysis is extended by the separate consideration of risky and dynamic specifications. In the following chapter, Zilberman, Wetzstein, and Marra examine long run aspects of the management of renewable and non-renewable resources within the previously developed analytical framework. A variety of specifics – such as monopoly extraction costs and backstop technologies – are discussed in detail. Chapter 4, by Taylor and Howitt, leaves the trail of economic analysis at the micro-level and reviews various aggregated models. Thus, they recognise the simultaneous impact of agricultural resource policy on different commodities as well as on the distribution of income among groups of farmers and regions. This chapter provides good technical assistance in choosing the appropriate model for the evaluation of a particular agricultural resource policy. In the fifth chapter, Antle and McGuskin assess agricultural progress beyond conventional measures of agricultural productivity, taking into account the environmental aspects of agricultural production. In the last chapter of this section, Zilberman and Marra examine the theory of externalities and discuss how market failure can be resolved with or without direct governmental intervention. All of these chapters are well written and can stand alone as complete papers. When read as a package, however, the authors tend to repeat one another, and a more concise presentation of the material would be desired.

Section 3 is comprised of three chapters in which analytical models are explored to address economic issues related to pesticides, water, and land resources. Chapter 7 by

Carlson and Wetzstein, chapter 8 by Boggess, Lacewell, and Zilberman, and chapter 9 by Miranowski and Cochran are all examples of state of the art research in the economics of these particular resources. These chapters, like all others in the book, are completed by extensive and up-to-date lists of references. In the fourth section, Reicheldorfer and Kramer describe an analytical framework for analysing policies that simultaneously affect the agricultural sector and the environment. The authors provide a theoretical background for the basis of public choice theory and analyse agricultural resource policy in the US.

The final section is written by Carlson and Zilberman. They extend the prevailing notion of agriculture in this book to realms such as agroforestry and aquaculture, and widen the perspective to current and emerging problems in resource economics that are particularly important for developing countries. In particular they note the key role of research and development in fields such as biotechnology in achieving sustainable resource use.

Agricultural and Environmental Resource Economics concentrates its economic analysis on the micro-level, advocating efficiency as defined by concepts of marginal value and opportunity costs. Aside from chapter 10, these concepts are never questioned and little attention is given to the recognised fact that economic efficiency, however achieved, is an allocative result referring to a particular distribution of entitlements. This seems especially important since the politicians shaping agricultural resource policy are not necessarily interested in economic efficiency. They are likely to be more concerned with maximising votes by distributing entitlements to their clients. Moreover, policy makers interested in economic efficiency will probably find little support in the book if they are looking for expertise in compelling questions such as institutional design and implementation analysis to resolve market failures.

This caveat aside, this book will be most useful as a source of material on environmental and resource economics in the classroom and as a textbook for beginning graduate students. If used for advanced undergraduate courses, the authors recommend selecting specific chapters since all of the models can not be covered in one semester. *Agricultural and Environmental Resource Economics* is elegantly written and brings together a broad variety of topics on resource economics in an integrated and cohesive whole. It provides a sound theoretical basis, a rich discussion of agricultural applications and reflects the state of the art in its field. Newcomers will find a comprehensive overview, and experienced practitioners useful 'nuggets' of knowledge and insight. In essence, the book can be highly recommended to all policy analysts, researchers and practitioners interested in agricultural resource economics irrespective of their background knowledge in this field. As mentioned in the preceding paragraph, however, it also reveals the limits of the discipline.

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Nick Hanley and Clive L. Spash
Cost-benefit Analysis and the Environment
Edward Elgar Publishing, 1993. ISBN 1 85278 455 5. 288 pp. Price: £39.95

Per-Olov Johansson
Cost-benefit Analysis of Environmental Change
Cambridge University Press, 1993. ISBN 0 521 44318 0. 232 pp. Price: £30/$49.95

Cost-benefit analysis is an instrument economists use to find out whether or not a planned project leads to a potential Pareto improvement. In order to answer this

Agricultural and environmental economics make it possible to accommodate change in our quest to realise what we value most and contribute to natural and human wellbeing. My research is on the impact of heterogeneity in the assessment of sustainable productivity change and efficiency of intensified farming systems.Â I soon realised that ideas that were most influential to society in the context of resource allocation and responsibility distribution were mainly used to interpret and justify rather than influence. It is the penultimate duty of a researcher to question their assumptions with direct impact. I look forward to building upon my work and further develop it. Environmental & Resource Economics Programs. Natural resources are important to produce food, fiber, timber, and bioenergy. Farm and forestlands provide carbon sequestration, clean air and water, scenic vistas, and biodiversity.Â Resource economists address how choices are made by farmers, ranchers, and policymakers; how policy incentives might motivate better choices; and the potential consequences and distribution effects of these choices.Â Northeastern Agricultural and Resource Economics Association. Online Access to Research in the Environment, UNEP. The Council on Food, Agricultural & Resource Economics. Resources for the Future. Sonoran Institute. Southern Agricultural Economics Association. Agricultural economics is an applied field of economics concerned with the application of economic theory in optimizing the production and distribution of food and fiber. Agricultural economics began as a branch of economics that specifically dealt with land usage, it focused on maximizing the crop yield while maintaining a good soil ecosystem. Throughout the 20th century the discipline expanded and the current scope of the discipline is much broader. Agricultural economics today includes a variety of