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Book review

Environmental Indicators and Agricultural Policy F.M. Brouwer, J.R. Crabtree (Eds.); CABI Publishing, 10 E 40th Street, Suite 3203, New York, NY 10016, USA, 1999, 305 pp, US$ 90.00, ISBN 0-85199-289-7

Environmental Indicators and Agricultural Policy is a collection of papers (presented as chapters) from a 1997 workshop. The main objective of the workshop was to integrate research results on pesticides, minerals, global warming, and landscape and nature into practical methods to identify and operationalize environmental indicators within the European Union (EU). The book consists of five parts preceded by an introductory chapter (Chapter 1), in which the editors emphasize that cross-national and long-term comparisons of environmental indicators require consistent methodologies.

Part I covers a general introduction to environmental indicators in the EU. Chapter 2 considers the selection of indicators as a trade-off between quality and cost of data collection for an indicator. A set of indicators is likely to differ among regions, as well as over time, due to varying local conditions. For those not well-versed in economic theory, this paper might not be an easy read.

Chapter 3 reviews the development of environmental indicators by the Organization for Economic Co-operation and Development (OECD), based on the 'Driving Force-State-Response' (DSR) framework. The discussion on shortcomings of indicators is wordy and muddled, and it does not lead to a clear conclusion. Chapter 4 describes a survey among experts to select Driving Force-indicators. A decision-tree regarding pesticide use explores the variety of societal actors involved and shows the resulting variety of information associated with the operationalization of a pesticide indicator. Chapter 5 links policy requirements for environmental indicators to national and international data availability, based on EU policy directives. Availability and quality of data is not yet consistent with policy requirements.

Part II covers a discussion on biodiversity and landscape indicators. Chapter 6 presents a conceptual framework, based on biogeographical and land-use characteristics, to identify indicators that assess landscape value. The framework, however, is not operationalized and discussed only in general terms: practical application of the framework, therefore, is not clear.

Chapter 7 reviews limitations of indicators within the DSR framework that measure the impact of agriculture on biodiversity. Driving Force-indicators such as pesticide use, State-indicators such as bird species, and Response-indicators such as ratio of protected areas to national territory all have shortcomings, mainly attributed to varying local conditions and to yet unknown relations among agricultural activities and biodiversity.

Chapter 8 presents a 'yardstick for biodiversity' as an indicator to assess the natural value of individual farms. Species are valued on rarity, population development, and international importance. The yardstick covers a limited number of species, so as to increase reliability of the indicator and to enable easy application. After a detailed description of the yardstick itself, the example provided is, unfortunately, rather feeble and barely illustrative.

Chapter 9 discusses three approaches to identify high nature value (HNV) farming systems: agricultural practices and farming systems in Europe that have been associated with emergence of semi-natural

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habitats on which many species depend. The first approach considers farming systems within protected natural areas to be HNV. The second identifies management requirements that support species relying on farmland for part or all of their lifecycles. The third assumes that low-intensity farming systems are HNV, and indicates characteristics of low-intensity farming systems.

Chapter 10 identifies indicators that characterize environmental health of extensive land-use systems. Based on a case study in the Iberian Peninsula, the process to identify initial indicators, select final indicators, and discuss data requirements of indicators is presented in a clear and well-organized way. Indicators are needed at county, local, and farm levels; data are not available for several essential indicators; and many indicators are specific to particular land-use system, thus complicating comparison.

Part III covers a discussion on environmental pollution indicators. Chapter 11 considers risk indicators regarding pesticide impact ranging from simple assessment of pesticide authorization, according to EU standards, to inclusion of weighting factors such as the actual proportion of a pesticide in the total application of pesticides. Principal component analysis, furthermore, is suggested to derive a limited number of independent indicators.

Chapter 12 selects indicators according to a least-cost criterion. The type of costs to be considered (e.g. opportunity costs) differ according to the anticipated use of the indicator (e.g. for extension purposes) and to the level at which the indicator will be used (e.g. farm level). A case study regarding water quality in Germany nicely illustrates the procedure. Chapter 13 discusses problems using nutrient balances as indicators of environmental load. Problems occur in calculation (data availability), information (a nutrient surplus does not explain the fate of nutrients), and application (nutrient balances are not comparable because of different underlying variables). An overview of the Finnish agri-environmental program is presented.

Part IV covers different perspectives on the relation between policy and sustainable development. Chapter 14, based on a case study in Scotland, illustrates in a transparent way the problems of identifying indicators related to sustainable development on a local scale. Environmental and economic pressures and impacts often go beyond local boundaries and cannot be controlled by local politics alone. The scope for interpreting change in sustainability on a local scale, therefore, becomes much reduced.

Chapter 15 presents a model developed to forecast effects of policy measures on net income of farmers. The model, additionally, includes impacts of policy measures on nutrient balances and biodiversity. The way in which nutrient balances and biodiversity are assessed, however, is questionable. Chapter 16 presents in general terms the identification of economic, ecological and societal indicators to operationalize sustainable forest management. Two approaches are highlighted: a top-down approach regarding policy at an (inter)national level, and a bottom-up approach regarding certification at a forest management level. Technical (lack of knowledge), organizational (lack of resources) and political (diverging interests) constraints still have to be overcome. Chapter 17 emphasizes that a move toward sustainable agriculture will be marked as much by a change of attitude in social communities and institutional organizations as it will be by monitoring the process using quantitative environmental indicators. Because the full environmental consequences will not become clear for several years, a search for attitudinal and institutional indicators is rightly suggested to judge meanwhile whether policy measures are set in the right direction. Identification of the indicators that are actually suggested, however, is difficult because they are cloaked in a lot of text.

What especially attracts attention while reading the various papers in this book is that there is no general agreement on how to identify and interpret environmental indicators. Recall that the editors, in the introduction to their book, hold out the prospect for an integration of research results into practical methods to identify and operationalize environmental indicators. Chapter 18 (Part V), however, is somewhat of a disappointment. It certainly is not easy to integrate the wide variety of opinions expressed by individual contributions, but the final chapter provides no new outlook at all on a consistent methodology. Moreover, the discussion refers more to external literature than reviewing contributions in the book itself.

The publisher's claim on the back of the book that "it is essential reading for agricultural and environmental economists and policy makers" is out of proportion, considering that the book hardly contributes new insights to already existing knowledge on environmental indicators. Although some chapters are well worth reading, *Environmental Indicators and Agricultural Policy* at best is a reasonable reference work on the current status of environmental indicators in the EU.

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