
BOOK REVIEW

Economic Approaches to Natural Resource and Environmental Quality Analysis, Natural Resources and The Environment, Series Volume 5, Maynard M. Hufschmidt and Eric L. Hyman (Editors), Tycooly International Publishing Limited, Dublin, Ireland, 1982

The stimulus for this volume was the recognition that many major resource and environmental quality impacts and associated values were not being adequately considered in the project plans of developing countries in the East and West. A fundamental problem continues to be the difficulty of quantifying these impacts in familiar monetary terms. In 1979, a conference was held to consider whether the environmental impact valuation techniques almost entirely developed in the United States are transferable to developing countries. Seventeen papers from the conference comprise this volume.

For those uninitiated in resource economics, the keynote paper by the editors, Hufschmidt and Hyman, is an excellent concise survey of the major concepts of resource economics (e.g., resource scarcity, common property resources, discounting, time rate of resource use, irreversibility and uncertainty, and intergenerational equity). It is also an excellent brief survey of valuation techniques (travel-cost method, property value approach, wage differential approach, and the human capital approach). I have not seen a better short survey of concepts (from resource scarcity to resource degradation) and valuation techniques.

The content of the book might best be described as resource economics applied to developing countries, with particular emphasis on using "extended" benefit-cost analysis to quantify environmental impacts of development projects. Extended benefit-cost analysis means incorporating extramarket considerations of a project into the analysis, for example, valuing the loss of recreational or amenity benefits if a wilderness area is developed or valuing the loss of health, income, or property if water pollution results from a project. There are two major techniques for valuing extramarket effects: 1) economic surrogates based on preferences revealed through behavior; and 2) survey measurement of demand such as bidding and estimation games. Because these techniques themselves involve surrogate measures of value, each has its own drawbacks. However, Hufschmidt and Hyman take care to point out the limitations of each technique.

The remaining sixteen papers range from complex theoretical institutional designs to encourage use of valuation techniques, to the application of such techniques to bauxite mining in Australia. Given the diversity in the papers, a conclusions section might have been added to summarize the observations of the conference participants on whether valuation methods developed in the United States can be used in analyzing the benefits and costs of proposed projects in developing countries.

The papers are of uneven quality, but each makes a contribution. Richard Bishop's paper clearly explains and summarizes the current state of knowledge on the travel-cost and hypothetical valuation methods for valuing recreational and amenity benefits. Alfredo Sfeir-Younis develops a theoretical compensation model for involuntary resettlement of the local population attending project development—whom to compensate, when, and

how much. He offers two applications of this theoretical model based on whether or not land is a constraint.

The papers reveal that developing countries are having mixed results in applying resource or environmental valuation techniques to projects. For example, New Zealand uses benefit–cost analysis as standard procedure for development projects but is having trouble with extended benefit–cost analysis. Gathering data on environmental impacts of a large-scale forestry project alone took several years, and they are finding valuation of the impacts even more difficult. Therefore, even when environmental impacts are of great concern, it may not be practical to use extended benefit–cost analysis. Because of pressure and shortages of trained staff, the results have been mixed even with conventional benefit–cost analysis.

In Malaysia, conventional benefit–cost analysis is a generally accepted procedure for assessing large development projects because they are financed by outside agencies such as the World Bank. Occasionally, the analysis might consider the project's impact on the environment, but only through subjective evaluation of decision makers. Usually such considerations are given secondary importance.

In Sri Lanka, the less quantifiable environmental impacts of development projects are omitted from the benefit–cost analysis, not because planners are unaware of the existence of environmental damages but because they emphasize the type of information needed to obtain foreign assistance.

In Australia, conventional benefit–cost analysis was used to evaluate a profitable bauxite mining venture in a natural forest environment. Unfortunately, extended benefit–cost analysis could not be done because data on recreational activities were not available and there were not studies of the option values associated with preserving jarrah forest and ecotypes.

What do these examples tell us? At a minimum, they indicate that there are numerous barriers to using extended benefit–cost analysis in evaluating development projects. The types of obstacles revealed in the papers are nowhere summarized in the volume. However, they appear to include five categories:

SOCIOECONOMIC BARRIERS. Pollution, resource conservation, recreation and amenity values generally receive different priorities in developing and developed countries. Issues of survival and severe socioeconomic inequality are likely to be far more important in developing countries and thereby confound the use of valuation methods. Illiteracy and meager income preclude the use of bidding or “willingness to pay” methods for valuing resources or environmental quality. In addition, land ownership and power may be the dominant factors in evaluating development projects.

CULTURAL BARRIERS. Valuation methods may be precluded by societal preference for bargaining, disdain for manual labor, or indifference toward the environment.

INSTITUTIONAL BARRIERS. Financing agencies devote their attention to technical feasibility and cost minimization as the criteria for project selection. Developing countries follow suit to attempt to secure a favorable outcome for a proposed development project.

THEORETICAL BARRIERS. There are several problems involved in the measurement of social values. For example, there are alternative definitions of consumer's surplus, value

judgments in social benefit–cost analysis, and subjectivity of perceived environmental quality indices. Also, distributive issues may not enter the analysis. There may be problems of credibility when the various valuation measures applied to the same resource situation yield quite different estimates of consumer surplus.

OPERATIONAL BARRIERS. Extended benefit–cost analysis is frequently hampered by a lack of data on pollutant emissions and damages as well as a lack of studies on valuing amenities or environmental quality. Not surprisingly, there is also a shortage of trained government staff in this type of analysis in developing countries.

The overriding message of this book is that extended benefit–cost analysis and other valuation methods have not been successfully used in any developing country. Of the national examples considered in the papers only Australia, a country comparable to the United States in terms of development, has had some success with applying valuation techniques. The obvious conclusion is that the effectiveness of applying benefit–cost analysis to environmental quality and/or resource preservation is directly related to the level of economic development of a country.

However, these difficulties should not deter us from improving the theory or give up applying extended benefit–cost analysis to proposed projects because it is hard to do. Development policies based solely on economic efficiency or conventional benefit–cost analysis simply cannot include all of any society's interest in resource and environmental management. For example, an agricultural development project requiring cutting of native forest lands may easily pass the benefit–cost ratio required by an international funding agency but incur the unvalued, but nonetheless real, loss of wildlands, wildlife, and plant growth productivity due to soil erosion from the cleared lands. Perhaps it is time for funding agencies of proposed projects in developing countries to rethink their selection criteria and incorporate incentives for developing countries to seriously evaluate resource and environmental impacts of proposed projects.

I recommend this book to a diverse group: economists willing to accept the challenge of valuing resource and environmental services not traded in the market; government planners and environmental professionals in developing countries concerned with all benefits and costs of a project, not just these with monetary value; administrators with international funding agencies interested in becoming enlightened on more than efficiency-based development policies; and students and professors in resource policy, economics, or management needing a quick refresher on concepts in resource economics and valuation methods.

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