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CURRENT LITERATURE ON THE ECONOMICS AND  
MANAGEMENT OF NATURAL RESOURCES

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## CURRENT LITERATURE ON THE ECONOMICS AND MANAGEMENT OF NATURAL RESOURCES

In response to Administrator Peter McPherson's request in 1986, AID's Agriculture Sector Council refined the focus of the Agency's agriculture, rural development, and nutrition program. The new focus emphasizes three objectives: 1) improve the income of the rural poor, 2) increase the availability of food, and 3) maintain and enhance the natural resource base. At the same time the new focus statement was being prepared, amendments to the Foreign Assistance Act of 1961 were drafted and finalized. Sections of these amendments stress the need for incorporating environmentally sound strategies into development assistance plans to ensure adequate protection of natural resources and ecosystems unique to the developing world. In this regard, the USDA/USAID Technical Inquiries Group felt it would be useful to provide AID Agricultural Development Officers information on currently available literature in the field of natural resource management and economics. Consequently, research of the worldwide literature was undertaken to identify relevant documents on the subject. This report contains the results of that research and provides a compilation of authoritative works on the economics and management of natural resources.

Research of the literature was conducted at the National Agricultural Library, Library of Congress and special, Washington, D.C.-area libraries with collections in natural resources. Numerous institutional sources were tapped including: the U.S. Department of Agriculture's Forest Service, Soil Conservation Service, and Economic Research Service; the International Union for Conservation of Nature and Natural Resources, Geneva; the United Nations Environment Programme, Nairobi; the Environment, Science and Technology Unit of the World Bank, Washington, D.C.; the East-West Environment and Policy Institute, Honolulu; the Tropical Renewable Resources Program, Ohio State University; and the International Institute for Environment and Development, Washington, D.C. In addition to the experts contacted at the above institutions, we conferred with resource economists Richard Norgaard, University of California at Berkeley; Jeffrey Leonard, the Conservation Foundation; and William Burley, World Resources Institute.

Material was collected and analyzed for its appropriateness to the needs of Agricultural Development Officers and the programs they manage. The publications selected have been grouped into three categories: basic, general texts that have application to both developed and developing countries; works concentrating on major resource issues in the Third World; and technical guidelines on resource economics and management for development project officers.

### BASIC TEXTS

The first category of available books provides basic or intermediate-level treatment of the theories and concepts of resource and environmental economics. Used in undergraduate classes at Rutgers University, Environmental Economics (1984) by Joseph Seneca and Michael Taussig applies the standard benefit-cost criteria of economics to a variety of environmental problems. Concerns discussed include air pollution, water quality, and hazardous waste management.

Although these types of problems are generally representative of industrial nations, the primary premises covered in this text are universal in scope.

Unpriced Values: Decisions Without Market Prices (1979) by John Sinden and Albert Worrell was written for managers, planners, and policymakers finding themselves in the difficult position of determining comparable values for unpriced "goods". Part I discusses the concept of value and the nature of valuation. Part II reviews and describes valuation methods recommended for use with unpriced benefits and costs. Several techniques are reviewed including total utility estimation strategies, market-price methods, and opportunity-cost techniques. Part III looks at why decisions involving unpriced values are considered difficult and shows how this negative perception may be mitigated by using appropriate analyses.

The science of resource economics is thoroughly covered in three texts: Natural Resource Economics: Policy Problems and Contemporary Analysis (1986) edited by Daniel Bromley; Alan Randall's Resource Economics: An Economic Approach to Natural Resource and Environmental Policy (1987); and Explorations in Natural Resource Economics (1982) by Kerry Smith and John Krutilla.

In Natural Resource Economics: Policy Problems and Contemporary Analysis editor Bromley and contributors look at natural resource economics as a distinctly applied policy science. Examined here are three broad policy issues: 1) consideration of posterity; 2) the presence of unwanted costs (externalities); and 3) the conflict between priced and unpriced goods. Resource Economics: An Economic Approach to Natural Resource and Environmental Policy is a graduate level treatment of the role economics plays in shaping natural resource policy. Political, legal and natural science concerns are also considered. The first two parts define the concepts and principles of environmental and natural resource policy. Parts III, IV, and V concentrate on applied aspects of policy issues. Finally, Explorations in Natural Resource Economics focuses on understanding the differences between conventional economics and the natural laws governing resource science. Emphasized are methods of resolving the differences by selection of appropriate techniques for incorporating natural resources in economic models.

Effective natural resource management requires input from a variety of disciplines. The failure to incorporate natural and social science concepts in the planning stage of resource development programs greatly impedes the success of such programs. Natural Resources and People: Conceptual Issues in Interdisciplinary Research (1986), edited by Kenneth Dahlberg and John Bennett, examines the conceptual issues and interrelationships involved in natural resource management. Three broad approaches to interdisciplinary research in resource management are assessed. They are 1) the disciplinary approach, which explores resource problems discipline by discipline; 2) the multidisciplinary, problem-oriented approach, which focuses on specific resource problems, drawing data and analytical procedures from various fields in an effort to resolve problems; and 3) approaches that utilize general systems theory. Contributors reflect on the strengths and weaknesses of their specific disciplines in terms of effective natural resource research and management, and numerous case studies are included to provide further insight into social interactions with natural resource systems.

### RESOURCE AND ENVIRONMENTAL ISSUES IN LDCs

The second category of books discussed focuses on major resource and environmental issues in developing countries. Although still relatively rare, publications concerned with the management and development of natural resources in the Third World have increased in number in the past ten years. This is due primarily to international recognition of the negative impact rapid economic growth has had on the natural resource base, thereby threatening long-term economic development.

Divesting Nature's Capital: the Political Economy of Environmental Abuse in the Third World (1985) edited by Jeffrey Leonard examines the numerous causes of environmental degradation in the Third World. The book is divided into three sections, with section one considering the interrelationship between economic prosperity and environmental management from both contemporary and historical perspectives. Parallels are drawn between past civilizations and today's Third World, where the tendency has been to maximize short-run political and economic goals at the expense of long-run economic and environmental welfare. Key issues addressed in section II concern the ubiquitousness of environmental abuses and natural resource degradation in developing countries. Reasons given for this widespread abuse include various administrative barriers and political pressures. The third and final section examines the political and economic trends (outlined in the previous sections) within the specific problem areas of deforestation, desertification, and pollution.

Additional resource issues in developing nations are discussed and analyzed in Managing Renewable Natural Resources in Developing Countries (1982) by Charles Howe and others. Reviews of specific management and policy program areas are provided. These include fishery management, forest policy, agricultural research policy, and water allocation and reclamation.

The primary mission of the Tropical Renewable Resources Program (TRRP), Ohio State University, is to identify, analyze, and resolve important renewable resource issues in developing countries. Established in 1982, TRRP is partially funded by AID, and has conducted research on a variety of resource topics around the world such as conservation tillage, wetland management, fuelwood development, and environmental management education. The latest findings and determinations of this consortium of social, biological, and physical scientists can be found in two 1987 publications: A Multidisciplinary Approach to Renewable Energy in Developing Countries edited by Hitzhusen and Macgregor and Sustainable Development of Natural Resources in the Third World, Southgate and Disinger, editors. The first describes the characteristics of renewable energy use in developing countries and provides feasibility analyses and implementation strategies for renewable energy options. Examples illustrating the above are taken from seven developing countries, including the Philippines, Ghana, and Costa Rica. The latter publication is a compilation of papers presented at the International Symposium on Sustainable Development of Natural Resources in the Third World held in Columbus, Ohio in September, 1985. Topics addressed include resource conservation and economic development, water resource management, fuelwood development, and private sector and government roles in renewable resource programs.

James Lee in The Environment, Public Health, and Human Ecology: Considerations for Economic Development (1985) draws on the experience of the World Bank to systematically review the effects of disregarding environmental concepts during the development process. This publication is meant to be an initial introduction to resource and environmental problems in developing nations; an extensive reference section provides the reader with additional, specific sources for further study.

#### TECHNICAL GUIDES FOR DEVELOPMENT PROJECTS

The final category of this report discusses publications that offer technical guidance to the planner or decisionmaker involved in development projects. Among the basic handbooks are a series of guidelines by the Volunteers in Technical Assistance (VITA), resulting from the Environmental Concerns in Development Conference, 1977 (sponsored by the Mohonk Trust). These simple guides were designed to assist development officers and field workers in planning and implementing environmentally sound, small-scale projects. Four guides are currently available; they concern energy, forestry, agriculture, and water projects.

Environment, Natural Systems, and Development: An Economic Valuation Guide (1983) by Hufschmidt and others presents strategies for combining natural resource economic techniques and environmental management with project evaluation in a developing country setting. A number of different analytical methods, practically applied to development projects, are discussed. Although the emphasis is on benefit-cost analysis, other techniques such as mathematical programming, simulation, and input-output analysis are also reviewed. Economic Valuation Techniques for the Environment: A Case Study Workbook (1986) was later written by Dixon and Hufschmidt to illustrate practical applications of the approaches recommended in Hufschmidt's 1983 publication.

A third source for guidelines in environmental management is Natural Systems for Development: What Planner's Need to Know (1983), an East-West Environment and Policy Institute publication. Written in nontechnical language, this manual gives decisionmakers a basis to predict the adverse effects a project may have on the surrounding resource base. It also provides techniques to correct adverse trends, and strategies to pursue in emergency situations. Contributors from Asia, the Pacific and the United States discuss topics such as air and water pollution, soil erosion, pest management, and wildlife conservation.

The Food and Agriculture Organization's Economic Analysis of Forestry Projects (FAO Forestry Paper No. 17) (1979) presents an in-depth application of theoretical models to forestry development projects. Authors Hans Gregersen and Arnoldo Contreras offer a practical approach to economic analysis of forestry projects and programs, taking into consideration that a "good" analysis depends greatly on individual circumstances. Although emphasis is entirely on the forestry sector, this publication has been included because of its detailed treatment of techniques for analyzing resource projects. Two companion volumes, Case Studies, Supplement 1, and Readings, Supplement 2, review and strengthen the techniques outlined in paper no.17. Another complementary FAO publication is Conservation Guide No. 7, Environmental Impact of Forestry (1982), written by Robert Zimmermann. Assessment methods are provided to enable planners to better determine potential, negative impacts of forestry projects.

SUMMARY

The material cited in the three categories above provides for a general knowledge of resource economics; an overview of the most critical resource issues facing planners in developing countries; and techniques for implementing natural resource management theory. Throughout the literature there is an emphasis on defining resource and environmental problems in both classical and non-conventional economic terms. Explanations and strategies for incorporating economic and natural science principles into development plans are presented in the publications recommended. Hopefully, these tools will assist Agricultural Development Officers and their staffs to more effectively implement ongoing and future projects designed to maintain and enhance the natural resource base.

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