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# BOOK REVIEWS

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## *Water Resource Management in Northern Mexico*

By Ronald Cummings. Resources for the Future, Inc., 1755 Massachusetts Avenue, N.W., Washington, D.C., 20036. 68 pages. 1972. \$3.50.

Many of the less developed countries have become acutely aware of the need to provide greater economic opportunity and higher living standards for their rural populace. Lip-service attention to the agricultural sector is no longer sufficient if population migration to overcrowded urban centers is to be arrested, national nutrition levels raised, and foreign exchange positions strengthened.

Several Latin American countries, including Argentina, Chile, Ecuador, Peru, and Mexico, are becoming increasingly dependent on irrigation to expand agricultural production. Partly because of climatic and topographic conditions, huge sums of money have been committed to transfer water supplies to existing and planned agricultural zones. Given the narrowing limits on financial resources available for development purposes, it is highly desirable that project planners utilize the water resource as efficiently as possible.

Ronald Cummings develops a methodology that should permit water managers in all countries to put an important question into the perspective necessary for dealing with it: How should a reservoir be managed and irrigation water be allocated so as to maximize the net social value of agricultural production? Cummings selected the Comarca Lagunera irrigation district in northeastern Mexico as a case study. Conditions in this area are similar to those in irrigation districts throughout Mexico: (a) the district is arid and receives its water supply from a distant (200 kilometers) mountain reservoir; (b) water receipts to the reservoir are erratic and evaporation rates are high (11.6 percent of annual water storage); (c) transmission losses are also high (50 to 70 percent of the water diverted from the reservoir) because of noncompacted dirt canals and laterals, and wide dispersion of the plots being irrigated; (d) water is allocated at the farm level in overly generous quotas based on a "maximum plant growth" concept of

efficiency, even though actual farm technology is quite backward.

Although the social criteria for water management are nebulous and nonquantifiable, Mexican government policies indicate major concern for providing farmers with maximum income levels as well as income stability from year to year. Reservoir management plays a crucial role in attaining these objectives. The optimal policy would in some way balance the forces that dictate small reservoir stocks and large annual releases (that is, social discount rates reflecting high time-preference rates for consumption and high water losses from evaporation) with those that call for large stocks and small releases (diminishing marginal productivity of water and the desire for income stability).

To show the trade-offs between income maximization, year-to-year income stability, and other criteria associated with alternative management decisions, Cummings formulates an optimization model based on maximizing the present value of expected net incomes. The relevant cost concerning alternative decision is defined as foregone income.

Solutions from the model were found to be particularly sensitive to the social discount rate, the evaporation rate of the reservoir stock, and the number of years in the planning horizon. The study indicated that high returns could be obtained by consolidating dispersed irrigation plots, thereby reducing transmission losses. It also appears that a reconsideration of water quotas, based on the existing low level of farm technology rather than on the high levels developed from experimental data, may result in lowering quotas of water per hectare. The net result would be an effective increase in water supply for distribution to new lands.

While the results of this study are not startling, the methodology used has general applicability for dealing with agricultural water resource development. The report is clearly written, and shows a thorough understanding not only of economic concepts but also of the institutional, political, and social factors that define the decision environment of resource managers.

John D. Sutton

*The Development of Tropical Lands:  
Policy Issues in Latin America*

By Michael Nelson. Published for Resources for the Future by The Johns Hopkins University Press, Baltimore, Md., 21218. 306 pages. 1973. \$12.50.

Resources for the Future's latest contribution to the comprehensive treatment of world resources focuses almost entirely on the humid tropics of Latin America, although the author draws on certain experiences outside the area. For a concise, economic presentation of problems encountered in settling humid tropics, however, one probably cannot do better than to start with this book. Seventy of its 300 pages are devoted to analysis of 24 selected development projects. Each of the eight chapters is well developed and can be taken out of context without limiting its effectiveness. (The presentation is buttressed by 33 tables, 11 maps, and six figures.) The author and Resources for the Future are to be commended for an excellent treatment of the subject.

Chapter headings are: The Role of Tropical Lands in Development in Latin America; Two Theories of Land Development in the Humid Tropics; The Development of New Lands; Current Practice and Problems; Project Evaluation; A Survey of Twenty-four Development Projects; The Conservation and Use of Natural Resources; Factors Affecting Development Policy; 1. Area Selection, Beneficiaries, and Infrastructure; 2. Economic, Technical, and Administrative; and Policy Implications and Project Design.

Visions of return to the Garden of Eden tend to color the public expectations of the development of tropic forests. Michael Nelson's well documented evidence indicates that the curse imposed on Adam, "by the sweat of thy brow shalt thou eat thy bread," continues to be true in the tropic forests of Latin America. Unfortunately, profitable exploitation of the tropic wilderness seems also to depend on continued exploitation of people who are accustomed to a subsistence level of living.

Nelson's "Two Theories of Land Development" boil down to reasons for and reasons against the concerted development of the humid tropics. The antidevelopment or conservationist approach looks at the enormous cost and lack of adequate knowledge or technology. The prodevelopment approach looks at the unused resources, the real human need, and the technological challenge of development.

So far, less than 15 percent of the Latin American humid tropics has been used for crops or pasture. About 2 percent is currently in crops; a somewhat larger area

has been used for crops and then abandoned or left in long rotation; and large areas of former cropland are now in permanent though largely unimproved pasture. About 10 percent of the total area is currently pastured.

What would be the impact on agricultural and forestry production and on world trade of the development of another continent the size of North America? This, in effect, is one question posed when considering the development of Latin America's humid tropics. The area's delineation is imprecise, since Nelson does not include the highland or desert areas, but somewhat arbitrarily includes the semiarid Chaco area of Bolivia and Paraguay; he omits the Yucatan Peninsula of Mexico, the Pacific Coast of Central America, and all of the Caribbean Islands. Nelson suggests that nearly 3 billion acres are available for development. This is an area somewhat larger than the United States and Canada below the northern limits of cultivation, and is about double the U.S. and Canadian area presently used for crops, pasture, and range.

About 68 percent of the area is currently in some type of forest and 26 percent is tropical savanna; the rest is semiarid land. Cultivation of Nelson's humid tropics is less affected by rugged topography or limited rainfall than is much of the United States and Canada. However, the area is more subject to flooding, poor drainage, and excess rainfall, which may be just as limiting to development for the foreseeable future.

Through Nelson's presentation run the themes of lack of technology, market problems, and land tenure and other institutional factors. He refers to both successes and failures in plantation agriculture but deals largely with attempts to settle small peasant farmers. He points out the sometimes contradictory nature of land settlement and agricultural production goals.

The allocation of large amounts of funds to subsidize and facilitate resource-wasteful exploitation poses a clear policy issue, for which he makes no clear recommendation. Apparently, governments and international agencies will continue their efforts to perfect the details of development, without clearly facing the issue of whether or not they should carry out the development. One thing is clear—it is essential to maintain a viable society while the search for development alternatives continues.

Howard A. Osborn

*World Bank Operations: Sectoral  
Programs and Policies*

Published for the International Bank for Reconstruction and Development by The Johns Hopkins University Press, Baltimore, Md., 21218. 513 pages. 1972. \$12.50.

The Bank for Reconstruction and Development (commonly known as the World Bank) has been lauded as a leading force in the fight against world poverty. No doubt it has resources to carry out this program. It has a total financial commitment of \$23 billion in 100 countries and lending operations now running at an annual rate of \$3 billion. However, the Bank has received strong criticism from both extremes of political and economic persuasion. It has been branded by the left as neocolonialist and paternally arrogant, and on the right as being without accountability.

The book is a series of papers written by Bank officials over a 12-month period, detailing a sector-by-sector analysis of problems and policies faced by the Bank in various fields. The 10 papers cover four broad areas in which the Bank operates: infrastructure, agriculture, industry, and general development. Each paper describes the economic, financial, and institutional characteristics of the sector and outlines the role played by each sector in the process of economic development.

For several decades following World War II the Bank was not the main force in international development. The recovery program of the United States, notably the Marshall Plan, was the major factor in economic aid. In the late 1960's, under the direction of Robert McNamara, the Bank made substantial expansion and diversification of its commitments, giving increasing attention to such matters as income distribution, environmental consideration, urbanization problems and research.

It was a wise procedure and resulted in many successful projects. What may have been overlooked, however, was that successful projects do not necessarily result in overall economic and social growth. Experience has shown that it is quite possible for a country to have many individual successful projects, but these may sustain little or no growth in the economy as a whole, because the mass of the people frequently are not participating in the fruits of the increased output. And there lies the key to the problem. If population continues to grow at the present rate there will be 15 billion people on the globe in 2125 compared with almost 4 billion today. If social and economic development is to be achieved, population growth must be reduced.

This book could be invaluable to all who are interested in economic development, since it is the first detailed picture of the World Bank at work.

Jack Ben-Rubin

### *The Life of Arthur Young, 1741-1820*

By John G. Gazley. American Philosophical Society, Independence Square, Philadelphia, Pa., 19106. 727 pages. 1973. \$10.

This is a strictly chronological biography of a leading exponent of the English agricultural revolution, whose writings were in the libraries of many of the American leaders in the late colonial and early national period. Young influenced the economic situation of the English farmer through voluminous writing and lectures. As Secretary of the British Board of Agriculture he made a number of County surveys and discussed legislation. Still serving in this capacity, at the age of 76 he prepared and sent out circulars to determine agricultural conditions, requesting information on rental and abandonment of farms, farm labor, and suggested remedies. However, much of the book relates to his interest in the political and religious life of the period, as well as family affairs.

### *The Council of Economic Advisers: Three Periods of Influence*

By Hugh S. Norton. Bureau of Business and Economic Research, University of South Carolina, Columbia, S.C., 29208. 72 pages. 1973. \$2.50 (paper).

The author discusses the Council during the administrations of Presidents Truman, Eisenhower, and Kennedy, as the periods of its peak influence.

### *Heritage of Plenty*

By Harold D. Guither. The Interstate Printers & Publishers, Inc. 19-27 North Jackson Street, Danville, Ill., 61832. 295 pages. 1972. \$4.95.

The author, who is Associate Professor of Agricultural Economics at the University of Illinois, presents strong statistical backing for this history of American agriculture. The volume is also unusual in that the author looks ahead to future agricultural development. The book is well arranged and, although the discussions are brief, substantial additional readings are listed for each chapter.