

THE ECONOMICS OF RESOURCE AND ENVIRONMENTAL MANAGEMENT

JOHN A. DIXON*
The World Bank

Resource and environmental management are topics of growing worldwide concern. Latin America is no exception to this and the countries in the region are placing increasing importance on the improved management of environmental resources. Environmental problems include both traditional pollution-related issues, largely revolving around air and water, as well as the equally complex issues of renewable and nonrenewable resources management. Whereas pollution issues are major urban concerns, resource management problems are more commonly found in rural areas. Of course, exceptions exist to this generalization. Polluted water in rural areas has major health and productivity effects. Similarly, the management of groundwater as a potentially renewable resource is a major urban problem in a number of countries.

In addition to the national concerns that are of primary importance to policy makers there are a growing set of international environmental issues that demand attention. In many cases cross-country externalities are involved as happens with acid rain or marine pollution. In other instances, such as the impact of CFC use on the earth's ozone layer or the buildup of CO₂ and other greenhouse gases in the atmosphere, the effects are truly global and may be very long lasting. Our ability to understand and analyze these issues is still in its infancy.

Whether the impacts are urban or rural, resource and environmental management decisions at the national level affect the well-being of individuals and economies. Improved resources management is not a luxury good that can only be afforded by the rich. It is a pressing concern that has direct economic impacts on individuals and societies and, as such, deserves increased attention from economists. The wise management of a nation's resource endowment is equally as important as practicing sound fiscal and monetary policies to help assure long-term and sustainable growth. The costs of ignoring resource management issues are high and will increase over time.

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Given the heavily urbanized populations of many Latin American countries, air and water pollution are major concerns. Such cities as Santiago, Mexico City and Sao Paulo face these problems daily and are paying the direct and indirect costs of polluted air and water. Urban pollution affects both the health and sense of well-being of urban residents. There may also be important pollution-associated costs to industry and the physical capital of cities. Polluted water increases production costs in many manufacturing processes and air pollution can result in damage to buildings and other capital items.

Rural resource management or environmental concerns frequently focus on the management of both renewable and nonrenewable natural resources—fish, forests, soils and agricultural lands among others. The problems of the Amazon region of a number of countries have received worldwide attention although other resources are also under stress. One thinks of the fishery off the west coast of the continent or the temperate forests in the Southern Cone countries. Agricultural lands and the soils and water that support them can be managed as renewable resources or can be "mined" to reap quick returns at the cost of longer term sustainability. Whether production is for own-consumption, for export or to replace imports, these resource products play an important role in the present and future growth of the region's economies.

The identification of the major resource or environmental problems is one thing; equally important is the analysis of the costs or benefits associated with alternative patterns of resource use and the identification of appropriate policies to overcome distortions. Sometimes resource misuse or environmental problems can be traced to market failures. In other situations the root cause may be a policy failure. In either case the analyst has a responsibility to help identify the economic costs and benefits of alternatives and help design appropriate policy responses.

This special issue of *Revista de Analisis Economico* focuses on these issues. The initial impetus for this issue was a special panel on resource and environmental economics organized for the IX Latin American Meeting of the Econometric Society held in Santiago de Chile in August, 1989. Three papers (by Maler, Lutz and Dixon) were presented at this panel and gave an overview of some major topics in the field. A number of other papers were then commissioned or submitted to complete this issue.

The first two papers present a broad overview of major topics. Maler surveys the topic of economic theory and its relation to environmental degradation. He examines several alternative approaches to the identification and evaluation of the economic impacts of environmental degradation. Daly, in contrast, takes a macroeconomic perspective on these issues and argues for a macroeconomic analysis of the optimal size of an economy relative to the ecosystem rather than just focussing on the more microeconomic question of optimal allocation.

Ei Serafy and Lutz examine the question of improved accounting for natural resources and the environment and how these assets can be incorporated into the system of national accounts. In this way the depletion of nonrenewable resources or the unsustainable use of potentially renewable resources will be more fully taken into account when assessing a country's economic growth. Dixon examines the opportunities and constraints for applying economic analysis to environmental problems. He overviews the evolution of economic analysis of the environment and surveys recent developments. In conclusion he suggests that more can be done than is frequently considered possible.

The remaining papers elaborate on these topics and discuss some of these issues in the context of Latin America. Chisari and Navajas present a theoretical approach to the understanding of the interactions of public expenditures and a sustainable rate of use of environmental resources at a national level. They examine the changes in the long-run

stock of an environmental resource that is used as an input into an economy-wide production function. Niklitschek proposes a model of resource conservation for rural subsistence households. In his dynamic framework at the household level, resource utilization decisions are interrelated with consumption and work. The particular case of agriculture in the Amazon is considered by Cunha and Kyle. They consider the interactions between resource management and growth in a peripheral, resource-abundant region.

Many topics are not covered in this issue. There are no papers dealing explicitly with urban pollution even though this is an area of major concern. Similarly the problem of managing forest or fishery resources is not covered. Soil erosion is an issue in a number of countries and improved soil management relates to a complicated set of institutional and economic policies that influence how individual resource users manage their land (or other resources). Property right issues may also be very important in explaining observed patterns of resource use, some of which may be unsustainable while others may be sustainable but inefficient. The question of the allocation of property rights and its impact on resources management is a problem that the former socialist economies of Eastern Europe are also grappling with at the present time.

Much remains to be done in the application of economic analysis to resource and environmental management concerns; the growing regional interest and the complexity of the problems being faced guarantee that this topic will occupy an increasingly central position on the agenda of both economists and policy makers in the future.