ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN

SERIE MEDIO AMBIENTE Y DESARROLLO 6

PRICES, PROPERTY AND MARKETS IN WATER ALLOCATION

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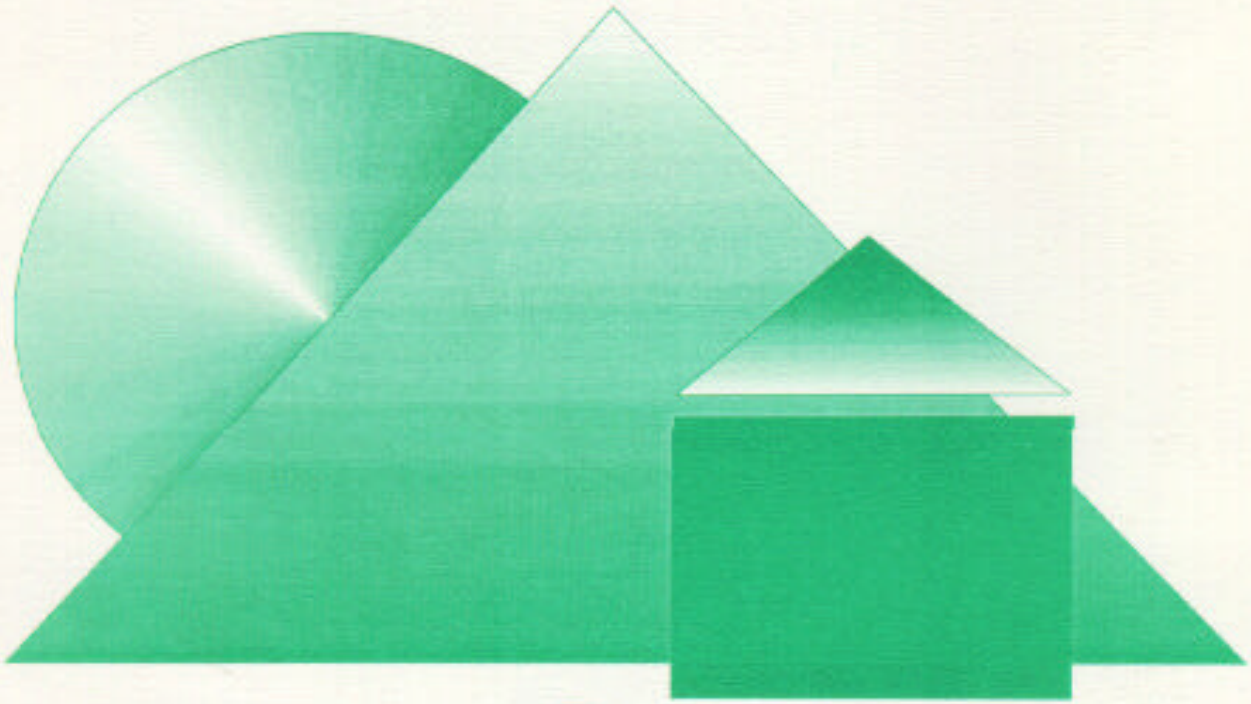

UNITED NATIONS

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Abstract

This paper examines the means to incorporate the use of market signals through prices into water resources management with the objective of improving efficiency in the allocation of water. It reviews a vast body of recent literature on tradable resource use rights as well as actual experiences with implementing tradable water rights programmes both in Latin America and in the rest of the world. The issues discussed include the conditions required for a well-functioning water market; the potential strengths and weaknesses claimed for markets as a means of water allocation; the characteristics of the operation of a water market; types of transactions; the initial allocation of water rights; design issues, including permanent and time-limited water rights, and hydrological security and allocation rules; the limitations of markets and the factors that can adversely affect their performance, including externalities (return flow, instream and area-of-origin effects), market power, transaction and transportation costs, and steps to mitigate them; and opportunities for expanding the role and scope of water markets.

Introduction

After many years of discussions at international forums and among international agencies active in water management, finally in the Dublin Statement, adopted at the International Conference on Water and the Environment in January 1992, the rhetoric of international meetings on water resources management recognized that water is essentially an economic good. The fourth Principle of the Dublin Statement asserts that: "Water has an economic value in all its competing uses and should be recognized as an economic good". This is not a very new proposal. Economists interested in water resources management have long argued the necessity to recognize that water is an economic good and not to treat water as having "unique importance" but as one good among all others.

> "This is not to deny that, as a commodity, water has its special features; for example, its supply is provided by nature partly as a store and partly as a flow, and it is available without cost in some locations but rather expensive to transport to others. Whatever reason we cite, however, the alleged unique *importance* of water disappears upon analysis" (Hirshleifer, De Haven and Milliman, 1960).

If water is an economic good then it should be possible to govern its allocation through the market. For many years, it has been widely recognized in the literature that in the absence of markets it is difficult, if not impossible, to evaluate the real demand for water-related services because demand-functions cannot be estimated in such a situation (Fox and Herfindahl, 1964). In the place of markets and the signals for efficiency in investment decision-making which they provide numerous, elaborate and unsatisfactory substitutes have been suggested. All these substitutes have in common that they provide only poor, if not incorrect signals, that they are essentially arbitrary and that they provide no real solution to the problem of achieving an efficient allocation of water. The only solution is to place as great a reliance as possible on prices and, therefore, on markets in the process of allocation of water and the related investments in productive services. If efficiency is the goal then the role of administrative allocation must be restricted to those few areas where markets cannot be developed and to the regulation of natural monopolies.

> "In light of the information problem, there seems to be little hope that administrative approaches can allocate water even with only minimal efficiency among the processes that result in marketable goods. It is not reasonable to expect a staff and a ... board to know what water is worth in every water use, which is necessary in order to know the economic efficiency of each board decision. The solution to the information problem will likely necessitate applying a market-like process for allocating water to produce market goods. The regulatory approach and the limited funds ... can then be focused on the areas where they are needed, which is in deciding water needs for the nonmarket goods" (Lynne, 1988).

It must be carefully considered, however, when advocating the introduction, extension or maintenance of public intervention in water allocation how effective it can be. Administrative approaches to water allocation are often criticized for their implicit reliance on "the ability of the few decision makers within a centralized structure to act objectively, omnisciently, and

responsibly in pursuit of the public interest" (Anderson and Leal, 1988). As was commented in the debates more than 30 years ago on this issue in the United States of America,

> "... that while public intervention was *necessary*, it need not be *sufficient* for improvement in efficiency. For intervention to be also a sufficient condition for improvement in efficiency, appropriate criteria must be developed and, assuming in the final analysis that there is a feasible way to do so, applied with sufficient fidelity to ensure that the objectives of public intervention in the interests of efficiency are reasonably approximated" (Krutilla, 1966).

In discussing public policy towards water management and the issue of using prices and introducing markets as a major tool for water allocation and, therefore, for water management, it has to be understood that "controlling the use of water courses is a basic economic problem of resource allocation" (Freeman and Haveman, 1971). A fact equally true for the quality and quantity aspects of allocation.

> "It is interesting to reflect that the large and lengthy debate on public policy for water management in the 1960s in the United States led to little innovation in water management practice. Water management and water allocation decisions remained largely in the hands of national or state bureaucratic agencies. The use of both prices and markets and river basin institutions has been of only marginal significance until comparatively recently with the increasing use of markets in water allocation in the western states of the Union" (Freeman and Haveman, 1971).

To come closer to the present and to the water management issues current in Latin America and the Caribbean, the increasing private participation in water management has brought with it as a corollary the wider opening of water management to market forces and increased the application of economic principles to water allocation decisions, at least in some areas. It has also increased the interest in directly employing prices and markets as the main tools for water allocation. One sign of this interest is the amount of literature discussing the experience of the few places where water markets exist, particularly the amount of interest shown in the Chilean experience.

The adoption of a market approach to water allocation in Chile has attracted much interest from all over the world, although serious economic analysis remains largely absent from the discussion of the Chilean experience. The findings of the one economic analysis that has been made suggests the importance of remedying this lack of serious economic evaluation (Hearne and Easter, 1995), but there is certainly much more literature on the current Chilean system than on any previous water allocation system adopted in any other Latin American country.