

... AND THE DESERT SHALL REJOICE: CONFLICT, GROWTH, AND JUSTICE IN ARID ENVIRONMENTS

By ARTHUR MAASS and RAYMOND L. ANDERSON
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... *And the Desert Shall Rejoice* is an ambitious undertaking. Maass and Anderson provide a detailed comparative study of six irrigation districts in Spain and the United States: Valencia, Murcia, Alicante, Kings River, Northeastern Colorado, and the Utah Valley. The scale alone distinguishes the work from most water and irrigation studies which are typically more narrowly focused. The authors are interested primarily in the institutional arrangements which have been established in the various regions to develop, allocate, and enforce use rights to irrigation water. They center their comparisons of the districts around three points which they assert reflect the goals of the community members: popular participation and local control, efficiency and economic growth, and equity. Maass and Anderson follow with simulations of the impact of local rules on crop production and income under various conditions ranging from excess run off to drought. While the simulations reflect considerable ingenuity, the book is largely descriptive without a formal, theoretical framework. A framework such as that provided by Davis and North and Mancur Olson regarding institutional change would have been helpful in motivating and channeling the discussion. The lack of a well-defined model may have led Maass and Anderson to include too much detail and to miss the opportunity to more thoroughly analyze the significant points they raise. For instance, the water allocation systems of Valencia and Murcia apparently have been constant since the Middle Ages. This is a remarkable situation given major changes in factor prices, particularly for water, and the growth of urban areas which compete for water. There must be, then, either significant transactions costs which retard adjustment or benefits to the existing system which reduce the incentive for change.

Equity issues regarding the assignment of water rights dominate much of the discussion of each district, particularly those in Spain and the Utah Valley in the U.S. Efficiency issues, on the other hand, are given less attention. It is not clear from the text why distributional questions should be so important to members of irrigation regions unless relatively equal shares reduce enforcement costs and facilitate maintenance of the institution.

In what may be the most fascinating portions of the book Maass and Anderson describe the history of each system. The most complete discussion involves the Kings River in California. There, private

canal companies were established in the late 1870's by developers to bring water to the rich agricultural lands of the San Joaquin Valley. To capture the rents and to cover the costs of canal building, the developers secured property rights to the land and recruited settlers from the East. As the Valley developed the canal companies were placed under the regulatory authority of the State and were granted the power to levy assessments and issue bonds. Later, however, there was conflict with the federal government as it attempted to impose the 360 acre limitation on size for farms receiving federally funded irrigation water.

. . . *And the Desert Shall Rejoice* is an important book which reflects the extensive and careful research effort carried out by Maass and Anderson. Its comparative approach isolates the important elements involved in the development of irrigation institutions. The observed patterns help to improve our understanding of those institutions which are vitally important in providing water for some of the world's most valuable crop land.

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