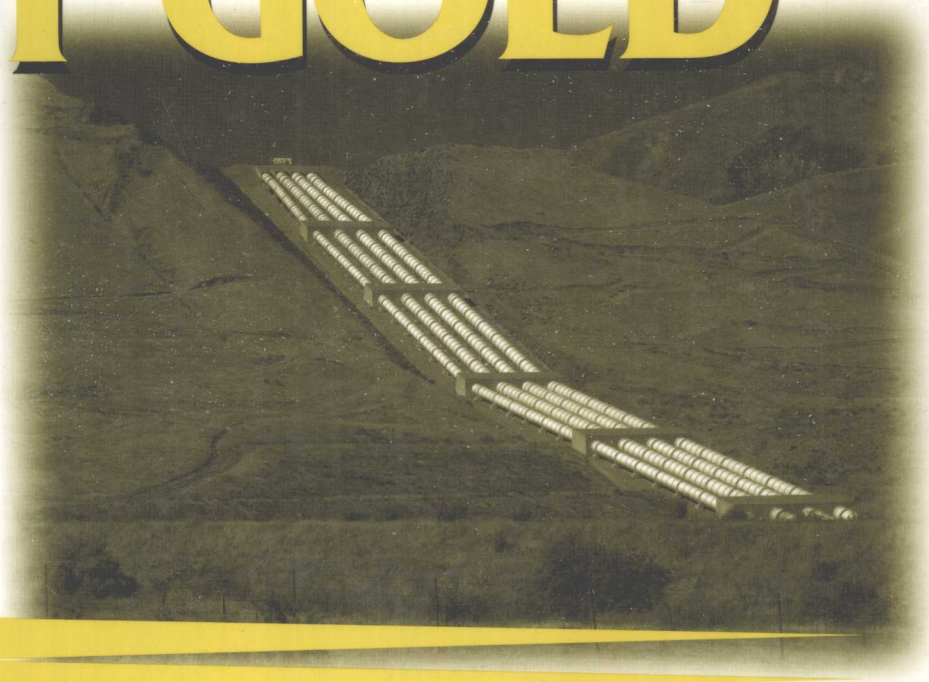
RIVERS of GOLD



Designing Markets to Allocate Water in California

BRENT M. HADDAD

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ISLAND PRESS
Washington, D.C. ◆ Covelo, California

Library of Congress Cataloging-in-Publication Data
Haddad, Brent M.
Rivers of gold : designing markets to allocate water in California / by Brent M. Haddad.
p. cm.
Originally presented as the author's thesis.
Includes bibliographical references and index.
ISBN 1–55963–711–0 (cloth). — ISBN 1–55963–712–9 (paper)
1. Water-supply—Economic aspects—California. 2. Water supply—Political aspects—California. 3. Water rights—California.
4. Federal-state controversies—United States. I. Title.
HD1694.C2h23 2000
333.91'009794—dc21 99–27758
CIP

Printed on recycled, acid-free paper

Manufactured in the United States of America
10 9 8 7 6 5 4 3 2 1

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Support for Island Press is provided by The Jenifer Altman Foundation, The Bullitt Foundation, The Mary Flagler Cary Charitable Trust, The Nathan Cummings Foundation, The Geraldine R. Dodge Foundation, The Charles Engelhard Foundation, The Ford Foundation, The Vira I. Heinz Endowment, The W. Alton Jones Foundation, The John D. and Catherine T. MacArthur Foundation, The Andrew W. Mellon Foundation, The Charles Stewart Mott Foundation, The Curtis and Edith Munson Foundation, The National Fish and Wildlife Foundation, The National Science Foundation, The New-Land Foundation, The David and Lucile Packard Foundation, The Pew Charitable Trusts, The Surdna Foundation, The Winslow Foundation, and individual donors.

RIVERS of GOLD

This book is affectionately dedicated
to Moyara, Bert, and Cypress

Preface
A Note on the Author's "Water Politics"

This being a book about water reallocation in a politically charged period, let us move straight to confessions and disclaimers regarding the author's stances on water politics. I grew up in southern California's San Fernando Valley. On clear days, I could see the outflow point of the Los Angeles Aqueduct sparkling on the distant hills. I had no idea where our water came from other than "the pipes." My interest in environmental issues grew out of anger at the fast pace of development in the San Fernando Valley (the transformation of my Little League baseball field into condominiums was the greatest insult) as well as family vacations to Lake Tahoe, where the same kind of development was occurring. My connections to California's farming sector came later on—first as a graduate student and now as a professor in a university department that includes strong agricultural interests. Today, living on California's central coast, I do not have an immediate hydrologic interest in the issues presented in this book. In my community, the water comes from coastal rivers and aquifers and is not connected to the larger state system. Having lived in or visited nearly every corner of the state, I have an appreciation for nearly every interest in the water-reallocation debates. I regularly tell students in my Water Policy classes that the confounding but interesting aspect of water reallocation is that it is a story not of "good guys" and "bad guys" but rather of parties with legitimate and deeply felt interests that, taken as a whole and without compromise, are incompatible.

I approached this topic initially for its connection with markets, as opposed to water (see, for example, Haddad 1997). Before returning to school for my M.B.A. and Ph.D. degrees, I had worked both as a broker of air pollution emission reduction credits and as a securities salesman and

sales manager, licensed to offer stocks, bonds, mutual funds, limited partnerships, real estate investment trusts, and many different forms of insurance. I was struck by the different workings of air pollution markets (very few, costly transactions in those days) and securities markets (numerous low-cost transactions). My doctoral research was therefore focused more on markets, with water allocation as a case study, than on water issues with a focus on market-based reallocation. In short, there was, and is, no political or economic interest driving my perspectives.

I view my role in water politics as informing a debate that others will decide. The list of design recommendations for water markets in chapter 8 is mine alone, and water-resource professionals will find that nobody is a complete winner or loser when the list is taken as a whole. If this book proves useful in informing the water-allocation debate and in providing an example of how one goes about studying economic institutions and natural resources, I will have partially fulfilled my side of a mutual commitment between myself as recipient of a public education and the public who paid for it.

How This Book Treats the Subject of Markets

For historical reasons, it has been difficult for writers to separate themselves from the twentieth century's political polarization with respect to markets. From roughly 1920 through 1990, countries of the Northern Hemisphere were divided into two camps, one favoring markets and the other opposing them. Not only were writers correctly concerned that their comments about markets could result in political backlashes against themselves, but also the entire context of the discussion of markets was colored by the political rivalry between East and West. Only rarely did researchers step outside the rivalry and address the strengths and weaknesses of markets as allocation mechanisms. One such example is F. A. Hayek's 1945 article, "The Use of Knowledge in Society."

Now, a decade after the collapse of the Soviet Union, things have changed. The "command economy" end of the historical polarity is in political shambles. But even the "free-market" end of the polarity is not unscathed. The historical high-water mark for free markets, or "pure markets," came on January 1, 1994, the day the North American Free Trade Agreement took effect and the Zapatistas launched their rebellion in Chiapas, Mexico. The boldness of the Zapatistas, and the broad scope of their critique of market-based social organization, reminded the world that post-Soviet-era markets may not solve all social problems and may even create

some. Since then, the inability of some nations, most notably Russia, to adopt market mechanisms suggests that markets have an institutional nature and cultural context that may not be universal.

The world's current agenda with respect to markets has to do in part with how societies can control markets in ways that make the most of their good qualities but minimize their harm. Markets are being questioned on many fronts, including unregulated trading of international currencies, trade in goods made by child and slave labor, trade in goods whose manufacture unduly damages the environment, trade that results in the dislocation or dispersion of indigenous or historical communities, and trade in genetically altered foodstuffs. At the same time, markets are being examined as ways to solve practical problems involving resource allocation. Markets are cropping up in unexpected places and with unexpected products to help subsets of society with allocation problems. The list of novel applications of markets includes air pollution control, fisheries management, reduction of lead in gasoline, and even provision of affordable housing.

Writers interested in markets no longer feel compelled to align themselves along the socialist–capitalist polarity (although some still do by choice). Today, writers can look back over the twentieth century's mountain of neoliberal and Marxian writings on markets like value hunters at a big open-air market of ideas. I am pleased, for example, to have come across A. M. Honoré's analysis of "full or liberal" property rights, which provides an anchor for chapter 3. In sum, this book should be seen as part of the new post-cold-war literature on the institutional nature of markets.

This book is based on the idea that markets in and of themselves have strengths and weaknesses that can be identified, described, and sometimes measured. These qualities can then be compared with those of other resource-allocation mechanisms and a choice among them made. The measure of a market's effectiveness has to do with how consistent the market's qualities are with the details of the context in which it is applied. Market effectiveness can be measured both in comparison with other resource-allocation mechanisms and in relation to minimum standards of social acceptability, ideas that are explained further in appendix 3. The immediate context here is the effort of the state of California to reallocate a portion of its developed water from agricultural use to urban and environmental uses. The larger context is similar efforts in other western states.

This work emerges from the doctoral dissertation I completed in 1996. Compared to the dissertation, there is a great deal of new material here, including this preface, the introduction, chapters 2 and 4, and substantial

rewrites of several other chapters. My hope is that interested parties of many backgrounds will read this book comfortably. Indeed, people of many backgrounds make up the state of California and will be facing the choices described here in the near future; if this book proves helpful to them in making those decisions, my effort in creating it will have been rewarded.

Acknowledgments

> "Without even knowing it, he had been pulled into that strangest of California sects. He had joined the water people."
>
> —Peter H. King, "Lost Amid the Water People"

Research on this book was launched on February 7, 1994, when Professor Joseph Sax noted to his Water Law class, in which I was a student: "They've been trying to create a water market for years here in California but haven't succeeded. No one knows why." Off I went after the lecture to find out. The search has accompanied me through my graduate-student, post-doctoral, and professorial days.

In getting to answers and, eventually, to recommendations, I have had great help along the way. First, I am indebted to the professors who took an interest in this project both in its dissertation phase at the Energy and Resources Group, University of California, Berkeley, and in its book phase: John Holdren, Richard Norgaard, Jeffrey Romm, Joseph Sax, and Oliver Williamson. I also received advice and comments on drafts from fellow students Andy Cohen, Bill Golove, Rich Hayes, Denny Kelso, Ann Kinzig, Katti Millock, Jurgen Salay, Tom Starrs, Corina Stetiu, and Anne Takahashi. More recently, my students in the Department of Environmental Studies at the University of California, Santa Cruz, including Joan Brunkard, Kimberly Merritt, Karsten Mueller, and Bruce Paton, have commented on drafts of the book and provided research assistance.

When I was getting started, I received valuable assistance in assembling bibliographies on water marketing from Penn Loh, Deborah Moore, Linda Vita-Sunnen and her staff at the University of California's Water Resources Center Archives, and Gary Weatherford. Dave Stoldt also provided valuable insights into the flows of both water and money.

A number of other water-resource professionals went out of their way to assist me in preparing this book. I am especially grateful to Fadi Z. Kamand and Timothy Quinn of the Metropolitan Water District of South-

ern California; Norman Hill, at that time with the California Department of Water Resources; Gerald Davisson of the Palo Verde Irrigation District; George Core of the Castaic Lake Water Agency; Marc Carpenter and Stephen Ottemoeller of the Westlands Water District; Adrienne Alvord of the Rural Water Impact Network; Gerald Shoaf, who represents the Coachella Valley Water District; and Paul Bartkiewicz, who represents the Yuba County Water Authority. In the highly charged atmosphere of California water politics, these professionals generously assisted me without attempting to assert any control over what this book eventually would say.

I am deeply grateful to the providers of my research and travel grants, including the National Science Foundation, the Energy Foundation, the John D. and Catherine T. MacArthur Foundation, and the University of California Centers for Water and Wildland Resources. I also undertook some field research while I served as a consultant to the Pacific Institute for Studies in Development, Environment, and Security.

To my Island Press editor, Todd Baldwin, thank you for your patience and your faith in this project. And thank you to my extended family, Hans and Maria Ruehsen, for your support throughout. And to my immediate family, Cypress, Bert, and Moyara Ruehsen-Haddad, thanks for your love and patience.

To those I have inadvertently left off this list: please accept both my apologies and my thanks. And to all who have contributed to this research, I hope it returns at least a portion of your investment. That is for you to decide. As William Mulholland once said, "There it is: come and take it."

Introduction
The Ghost of Owens Valley

The Owens Valley lies east of the Sierra Nevada range, completely within California's boundaries, with the White Mountains rising on its Nevada side. The valley's largest town is Bishop, with a population of 3,500. Shortly after the turn of the twentieth century, officials of the city of Los Angeles assembled lists of farm owners in the Owens Valley. Disguising their identities, city agents then approached the farmers individually and offered them option contracts to sell their land—cash payments in exchange for the option to purchase their farms in the future at a specified price. Most of the farmers voluntarily agreed. They signed the contracts. When nearly all the farmers in the valley had signed, the city of Los Angeles exercised its options and took ownership of the farms. When the few remaining farmers began to realize that their land was losing value as a result of the buyouts, the city generously agreed to purchase their farms at the earlier, higher value.

Why is this arguably the most important single event in California's water history? Clearly, Los Angeles did not want to farm the land. It was after the water. The farmers had water rights to the Owens River, which runs north to south down the middle of the valley, and when their land was sold, their water rights accompanied the land. By 1913, after it had built a huge aqueduct from the Owens Valley across the Mojave Desert, Los Angeles diverted what had been water destined for valley farmland to urban uses along California's southern coast.

Yet the importance of the Owens Valley is even greater than this enormous diversion of water from agricultural to urban uses. In fact, when water people get to talking, the very name *Owens Valley* stands by itself as a complete sentence. Why do the events in the Owens Valley still hover like

a ghost over water planning, not just in California but throughout the arid West?

The answer to this question lies in similarities between conditions at the turn of the twentieth century and conditions today. That is to say, in its basics, the situation has not appreciably changed. California farmers still use the vast majority of developed water in the state. California still has thirsty, growing, well-financed cities that are searching for new water supplies. Farms were and are an obvious source. Although today there are other voices in water-supply debates—environmentalists, hydropower interests, recreational interests, and regional growth interests—the two most important camps in water debates remain the cities with their water agencies and the farmers with their irrigation districts. If anything, this context is more threatening to farmers today because the state now has adequate infrastructure to move water from almost any farming region to almost any major city. The two key elements of the state's infrastructure are the California Aqueduct, which runs north to south, and the Colorado River Aqueduct, which runs east to west. Both aqueducts end up in the urbanized and rapidly growing southern-coast region. Neither existed in 1905.

Today, the first sentence on the town of Bishop's "Welcome to Bishop, California!" World Wide Web page sums up the effects of the transfer: "Bishop sits directly in the middle of about a zillion square miles of incredible natural beauty. . . ."[1] Today, a beautiful, quiet, empty valley lies behind the Sierra Nevada. The town of Bishop survives, as do a couple of others, but the Owens Valley is no longer the booming region it was at the turn of the twentieth century.[2] The farms are largely gone. With them went farmers and farmworkers and their families; grain stores and implement shops and their owners, employees, and families; and so many other elements of a thriving agricultural community. Today, the Owens Valley is an outdoor recreation destination and little more.

What is the importance today of the Owens Valley story? It is the cautionary tale of what can happen to an agricultural community when farmers surrender water rights to a thirsty, growing city. When the water goes, so goes the way of life.

A New Era of Water Reallocation

Numerous trends suggest that a further significant reallocation of water from agricultural to urban regions is likely to occur in western states in the coming decades. Certainly not all or even most agricultural water will be reallocated, but reallocation of as much as 15 percent of current agricul-

tural usage is plausible. If cities in California were to get 15 percent of what agriculture in California currently uses, urban water availability would rise by more than half. This would be more than enough to meet new urban demands well into the twenty-first century.

An overall reduction of 15 percent or less in agricultural water use may not seem like much to an outsider; it leaves 85 percent of current usage in agriculture. But what if it were *your* irrigation-dependent farm being asked to give up the water, or your entire irrigation district? And what if, as in the Owens Valley, it was not just 15 percent that your region was going to lose, but in fact even more would be needed to preserve ecosystems and their functions? What if your farm and your region were barely getting along economically, but you and your neighbors were strongly committed to rural ways of life and to farming? Why should your way of life be sacrificed to fill swimming pools in southern California or to facilitate urban sprawl? And finally, property rights and contractual rights matter. If farmers and irrigation districts have rights to 85 percent of the state's developed water, why should they not be allowed to keep them if they so choose?

There is a clash of legitimate interests over the topic of water reallocation. Cities point to growth projections that indicate they will need more water to sustain public health and economic growth. Environmentalists point to scientific studies and public-opinion surveys that call for conservation and restoration of degraded waterways and wetlands. And farmers point to the centrality of water to their livelihood, to the cultural preservation of entire rural communities, and to food security for California and the United States.

Since the Owens Valley episode, California and other states have managed to avoid the collision of these three interests simply by developing new supplies. New dams, reservoirs, and aqueducts have been constructed so that additional surface waters could be allocated to cities and irrigation districts. But we are now at a point where new supplies are unlikely to save states from having to make hard reallocation choices. Most of the best dam sites are already occupied. That means that new dams will be more costly and less productive in terms of water storage and hydropower production. New dams will face tighter scrutiny with respect to environmental damage, and their owners will be responsible for costly mitigation. They will probably face opposition from well-organized local and nonlocal groups. Moreover, they will very likely have to pay for themselves, without the benefit of federal grants and loans.

One last factor that has postponed this new era of water reallocation is rapidly disappearing. It is the excess supplies of water historically delivered

to cities. These excess supplies gave the impression for decades that Los Angeles and other southern-coast cities were water-rich even though it rarely rained there and no significant natural rivers flowed nearby. Today, however, no one labors under the illusion of excess. Conservation practices have stretched water supplies. While the amount of water that cities can truly conserve is still debated, certainly the reservoir of potential conservation is much lower at the beginning of the twenty-first century than it was even a decade earlier. In sum, the new era of water reallocation has come, with all of the long-postponed painful choices that era entails.

Water Markets: The Reallocation Policy of Choice

In the 1970s, water markets were first introduced as a potential mechanism for reallocating arid-state water resources. Such markets would redistribute water to higher-valued uses: those who could generate value from water equal to or higher than the market price would pay that price, and others would conserve or find substitutes for freshwater. The proposals were grand and optimistic: a statewide California water market would be established in which any water user could buy and sell water rights. California already had the necessary plumbing to provide conveyance mechanisms for water transfers. A prevailing price for water would emerge. Owners of water rights could make good decisions about whether to hold or sell their rights. Water-market advocates identified the many positive aspects of markets in general (such as economic efficiency, individual choice, and political neutrality in reallocation) that would accompany water markets.

Still, sides were soon drawn with respect to who favored and who opposed water markets. Not surprisingly, market advocates primarily included those who wanted to acquire water and had lots of money to do so: urban water agencies. Allied with the urban agencies were banking, industrial, and development interests, all of whom were concerned about the effect of long-term water shortages on urban growth. Pro-market economists also supported water markets, and they lent their analytical powers to policy debates. Environmental interests lent their support because they saw markets both as a way of relieving pressure to build new dams and as a potential new source of water for environmental restoration and conservation.

Market opponents were more diverse and their positions less clear. Farmers and irrigation districts were not opposed to a market mechanism per se, only to one that stood the chance of being dominated by urban interests. Use of short-term markets for water rights (i.e., seasonal or year-

long transfers of water) within and sometimes between irrigation districts has been a common practice in agricultural regions for decades and has been acceptable to farmers. Although these opponents of long-term markets did not clearly enunciate what kind of water market would be acceptable to them, in water-market debates, agricultural interests have often distinguished between water as a *commodity* and water as an *input to the agricultural economy.* The distinction lies in both the direction of desired trading and the volume of trading. If water is characterized as a tradable commodity, the policy implication is to create bulk markets that reward the highest bidders, presumably cities and other governmental entities on behalf of environmental interests. But if water is characterized as an input to the agricultural economy, the direction of reallocation is rural to rural and the volume of trading is reduced. This rhetorical distinction is so important to some representatives of agricultural interests that they avoid using such terms as *water market* and *water trading,* instead using the term *water transfer* because it does not necessarily imply a market.

Other water-market opponents were unequivocal, but their lack of organization, small numbers, and lack of financial clout meant that their voices were barely heard in policy debates. In general, anyone who did not control water rights but benefited from their current allocation was likely to oppose market-based reallocation. Officials of rural county and city governments feared that if farms in their jurisdictions were fallowed as a result of water transfers, the local economy would suffer, unemployment would rise, and the demand for public services would rise at the same time that the tax base dwindled. Farmers dependent on well water feared that neighbors who transferred surface-water rights for profit might then tap into the aquifer, thus drawing down a shared resource in order to profit from a private transaction. Finally, parties who wanted water but knew they could not compete on price with urban interests in the southern part of the state also were likely to oppose water markets. This included development interests in the northern part of the state who feared that market-based transfers to southern California could tie up the existing supply (much of which originates in northern snowfall) for decades, thus postponing the north's economic development.

With a strong constituency supporting water markets, and the strongest voices in opposition to water markets merely making the case that some kinds of water markets were acceptable but other kinds were not, California's state legislature took steps in the 1980s and 1990s to establish water markets.[3] Market-based water reallocation became, and remains, the stated policy goal in California.