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Volume 7, No. 2

September 1999

# INLAND EMPIRE REVIEW

Published by

THE A. GARY ANDERSON GRADUATE SCHOOL OF MANAGEMENT  
UNIVERSITY OF CALIFORNIA, RIVERSIDE  
INLAND EMPIRE ECONOMIC DATABANK AND FORECASTING CENTER

## EXECUTIVE SUMMARY

A proposed water transfer from Imperial Valley to San Diego has been criticized on the grounds that it will damage the environment at the Salton Sea. However, those criticisms ignore the question of whether current water run-off levels into the Sea are an efficient use of an increasingly scarce natural resource.

A market for water resources is coming. Those groups currently depositing water into the Sea will gradually be confronted with greater incentives for conserving water (thus reducing deposits into the Sea). If continuation of current run-off levels should indeed prove desirable, it will become necessary to enact subsidies to induce continued such run-offs. Such subsidies would be a legitimate element of the costs of a successful and efficient restoration of the Salton Sea.

## Water Economics and the Salton Sea

### INTRODUCTION

A local community group recently criticized a proposed water transfer from Imperial Irrigation District (hereafter IID) to the San Diego County Water Authority. (The transfer will be hereafter be called the IV-SD transfer). Currently, Imperial Valley farmers utilize nearly their full allotment of Colorado River water. Under the proposed transfer, farmers would conserve water in their operations and "sell" it to San Diego at market prices.

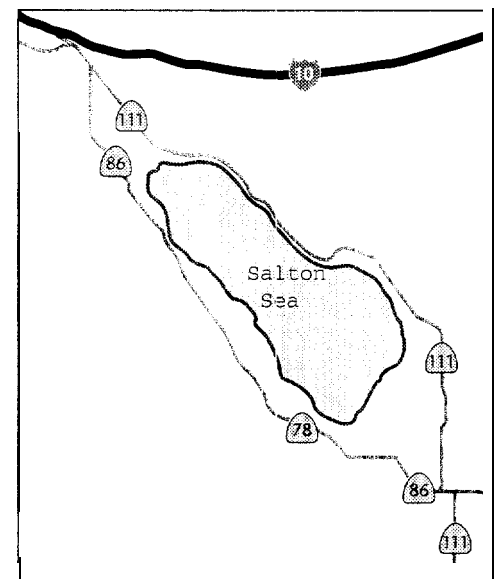
Lower water usage by farmers means reduced run-off into the Salton Sea. If such lower run-offs weren't replaced, the surface level of the Sea would decline as much as 24 feet from present levels, and the shoreline would recede by up to five miles at some points.

The community group mentioned opposes the water transfer because of resulting damage to wildlife habitats around the Sea. The Salton Sea has become a major avian stop-over on the North American Flyway. Receding Salton Sea water levels would jeopardize the utility of the region to migratory birds:

It is easy to understand and sympathize with these environmental concerns. However, it also appears that the protests themselves are short-

sighted. The proposed Imperial Valley water transfer is, at root, an effort toward water conservation. It is motivated by awareness of the growing scarcity of water resources and the likely high price that water resources will command as market forces begin to inform water allocation decisions. Decisions or claims about the environmental contribution of the Salton Sea should be balanced by an awareness of the social cost (opportunity cost) of the water resources the Sea requires.

We argue here that the IV-SD transfer would likely proceed even if environmental groups themselves owned the water rights rather than IID. Even if it



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could be determined that society as a whole is better off without the transfer and with current run-off levels, the best way to enforce this determination would be

through market incentives and voluntary compliance by Imperial Valley farmers, not through coerced continuation of run-off deposits. In sum, we need to soberly

and cooperatively determine how much water conservation is really called for in the Salton Basin.

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## THE ECONOMICS OF EMERGING WATER MARKETS

20th Century growth and development throughout the Southwest have brought us to the point where water is one of our scarcest and most precious resources. Environmental economics dictates that we utilize these water resources more intelligently and efficiently. That can best be achieved by letting market forces inform water allocation decisions.

Again, it is likely that an open market for water will emerge in coming decades, one in which the going market price will be well above those which our municipalities currently pay for their current allocations. The higher market price will encourage more efficient water utilization, and this will result in different development patterns from current ones.

Do you think this is an exaggeration? Southern California is already in an unsustainable water-usage situation. Under the set of court decisions, legislation, treaties, and agreements known collectively as the Law of the River, the Metropolitan Water District (MWD) is allocated 4.4 million acre-feet of Colorado River water per

year for use by its Southern California constituents (mostly in the coastal regions and the Inland Empire). We currently utilize 5.2 million acre-feet per year, drawing on the current unused portion of Arizona's allotment.

This "overdraw" will not be possible when growth in Arizona brings their water usage up to their full allotment. The federal government has already instructed the MWD to plan for a gradual reduction in usage by Southern California back to within its allotment (known as the 4.4 Plan). Meanwhile, we are already fully utilizing water resources from the Owens Valley and the California Aqueduct, and there are some indications that Coachella Valley's underground springs are becoming undermined by rapidly growing water use there. Meanwhile, such storage sites as the Eastside Reservoir are intended for disaster usage (in the event the California Aqueduct is disabled), not for regular consumption.

Given these scarcities and in order to ensure continued water availability for our current population, much less to allow further population growth, more efficient use of our water resources is

imperative. Water is obviously not a free commodity, and allocations which implicitly regard it as such are inefficient and wasteful.

The IV-SD transfer is one attempt to deal with these exigencies. IID's Colorado River water allotment is separate from Southern California's, and San Diego's attempt to obtain usage of some of IID's allotment could make compliance with the 4.4 Plan go more smoothly.

Current deliberations for the IV-SD transfer imply an eventual market price for water as high as \$315 per acre-foot. (Initial prices under the transfer will be lower than this, allowing for temporary discounts below market price and for different "wheeling" or transportation costs.) Mean while, Colorado River water is currently provided to municipalities free at its source. Wheeling costs from the source to point of usage are added in, resulting in gross costs to Imperial Valley users of about \$15 per acre-foot.

It would appear that many municipalities' current planning decisions are based on similarly low valuation of water resources. Needless to say, as the perceived price

of water usage rises to a more sustainable market level, community water utilization decisions will inevitably change, as they must.

## **WATER USAGE AND THE SALTON SEA**

This brings us back to the Salton Sea. Again, Imperial Valley farmers have been called short-sighted for even considering transferring water and thus altering conditions at the Salton Sea. But, again, this transfer is at root an attempt to conserve water and transfer it to a more valuable, more beneficial usage. Is water conservation--whatever its motive--short-sighted?

In other words, criticisms of the water transfer have been raised without mention of the costs of the water in question, and this does appear to be short-sighted. Environmental concerns are important, but at what cost?

In its deliberations concerning Salton Sea restoration, the federal government is allowing for eventual water transfers of as much as 500,000 acre-feet per year. (The current IV-SD transfer agreement would total no more than 200,000

acre-feet per year.) At a likely market price of \$315 per acre-foot, this amounts to a possible loss of \$157.5 million PER YEAR worth of water.

Does preservation of current environmental conditions at the Salton Sea justify continued, implicit expenditures of such amounts to sustain such flows? Should we continue to deposit such vast amounts of water into a salt lake, or should we instead consider transfer of these to community groups willing to pay full value? To put it differently, does it make sense to continue to spend \$157.5 million per year to maintain a bird sanctuary in the middle of the desert?

Let's turn the issue around. Suppose you were part of an environmental group charged with protecting birds and other wildlife, and suppose you were allotted \$157.5 million per year for this mission. How could you best utilize those funds? Would you spend this whole amount to purchase fresh water with which to maintain the Salton Sea sanctuary? Or would you spend a smaller amount to refurbish/construct sanctuaries (elsewhere?) and use

remaining funds on other projects?

Is continued agricultural usage and run-off to the Salton Sea the most efficient use of Colorado River water resources? This is the crucial question, from an environmental or an economic point of view. A finding of economics called the Coase Theorem suggests that this is precisely the question that market pricing of water will resolve. (See accompanying box.) If market pricing of water results in greater water conservation in the Imperial Valley and increased usage elsewhere, then such transfers are socially beneficial from all perspectives.


## **HUMAN USAGE LIKELY NECESSARY TO JUSTIFY CURRENT SALTON WATER LEVELS/USAGE**

So what is the most beneficial use of the Colorado River water currently utilized by Imperial Valley farmers? Is it continued such usage and run-off to the Salton Sea or sale and transfer to San Diego? That depends on the relative benefits accrued under either utilization.

The value of the water to

## **WATER PRICES AT \$315 PER ACRE-FOOT?**

If this discussion has you worried about **unaffordable** consumer prices for **tap** water, don't be. Even \$315 per acre-foot for water **works** out to over 10 **gallons per** penny. If you check your current water **bill**, you are probably already paying upwards of **\$600** per acre-foot for home-use. The more rational, market pricing for water may affect **community** planning decisions and construction of such high water-consumers as swimming pools and golf courses, but it won't make you go thirsty.



San Diego can be inferred from the price it is willing to pay for it, as much as \$315 per acre-foot (once discounts are removed and wheeling costs are factored in). How does that stack up against the value of the water to the whole Salton Basin? Well, we already know that this market price exceeds the value of the water to Imperial Valley farmers, else they wouldn't be willing to sell it at that price.

The total cost to farmers of Colorado River water is about \$15 per acre-foot. They are willing to pay this price to use the water. At any price more than \$250, however, their inclination is to transfer the rights to San Diego. However, in order to

fulfill this transfer, the farmers must undertake costly steps to conserve water in their irrigation and farming practices. The estimates we've heard are that it will cost about \$170 per acre-foot or more to effect the conservation necessary to transfer water to San Diego.

In other words, the farmers are willing to sell the water at a net revenue of \$80, which means that the total benefit to them of using the water can be no more than \$95 (80 plus 15; that is, they would rather sell the water at a net revenue of \$80 than use it at a cost of \$15, which means that the benefits from usage must be less than \$95). So the

benefits of the water to them are somewhere between \$15 and \$95 per acre-foot.

This leaves a large gap. The water is worth as much as \$315 per acre-foot to San Diego, but less than \$95 per acre-foot to IV farmers. In order for it to be beneficial to continue current water usage (and run-off) rates, the value of water to the Salton Sea ecology and to prospective Salton Sea commercial developments would have to be more than \$220 per acre-foot.

So, again, how much would it be worth to an environmental group to continue current water flows into the Sea? Could the environ-

## THE COASE THEOREM AND RESOURCE ALLOCATION

Market forces work to allocate resources to their most efficient use. Which use of a resource is most efficient doesn't depend on who owns the resource or on who has the usage rights to it.

Thus, the Coase "Theorem" asserts that the designation of ownership or property rights to resources via legislation, litigation, or custom has no effect on the allocation of those resources. Laws and court decisions can determine who pays whom to utilize the resources, but they won't determine how the resources are utilized. This finding was elaborated by Professor Ronald Coase, for whom the result is named, and it has provided the foundation for the whole field of Law and Economics.

Suppose a community sues a manufacturer for operating a noisy, distasteful plant. Suppose it is worth \$20 million to the company to operate there, but that it is worth \$15 million to the community for it to move.

If the courts rule in favor of the community, the company will pay between \$15 million and \$20 million to continue its operations in the community. If the courts decide with the

company, no such "reparations" will be paid. In either case though, the plant will remain.

In order for the company to leave, the damage to the community would have to exceed the benefits to the company. Thus, suppose it is worth \$25 million to the community for the company to move its plant. In that case, the company would leave no matter how the courts ruled. A ruling for the community will have the company leaving uncompensated. If the courts ruled with the company, it would be worthwhile to the community to pay somewhere between \$20 million and \$25 million for the company to leave.

Coase's theorem, again, states that court decisions and legislation affect the direction of payments flows, but not the allocation of resources.

In the present case, this result implies that whether or not water will be transferred from Imperial Valley to San Diego depends only on whether or not the benefits of the water to San Diego exceed the total benefits of it to the **Salton** Basin community and not on who owns the water rights.

mental benefits of avoiding a 500,000 acre-foot per year decline in Salton Sea inflows be worth \$110 million per year FOREVER? Such a flow capitalizes to a present value of over \$3 billion. It is unlikely that the Sea provides that much value to the ecology. A suitable, alternate avian stopover could be constructed for a much smaller sum.

(By way of comparison, it is widely publicized that local governments are paying about \$50 million to repair/offset damage to the habitat of the Stephenson Kangaroo Rat [SKR] caused by construction of the Eastside Reservoir, March Inland Port, and other facilities. Remember that those outlays are a ONE-TIME expenditure, in contrast to the \$110 million or more worth of water alone which must annually be allocated to the Salton Sea to preserve the current ecology.)

In other words, in order to fully close the gap between benefits and justify continued water usage rates in the Salton Basin, there most likely must be the possibility of substantial human recreational use of the Sea in the event of Salton Sea restoration. In our initial study of the Sea restoration two years ago, this Center estimated that a full, successful Salton Sea restoration would give rise to increased commercial and recreational (human) benefits from the Sea in the area of as much as \$300 million per year.

Now, those human benefits cannot be achieved without

substantial and costly restoration efforts: desalinization, de-eutrophication, water level stabilization, etc. Still, the benefits are of the same order of magnitude as the costs of restoration and of continued dedication of substantial water flows to the Sea. In other words, while environmental groups may not like this reality, the fact is that the Sea must be restored for both human and recreational use if continuation of current water flows is to be justified.

#### SUBSIDIZE FARMER'S WATER USAGE?

Now, our analysis earlier stated that a market solution could achieve the most beneficial usage of the water. However, some modification of current mechanisms must be made. We've stated that it makes sense to continue current water usage rates in the Salton Basin if the total benefits of the usage match or exceed the total benefits to San Diego. We've also stated that it will take substantial human usage--as well as animal usage--for this to be true.

IV farmers are the ones making the decisions about water usage, and the current problem is that they factor only their own benefits into their usage decision. Some mechanism must be introduced to allow them to factor in benefits to the rest of the Salton Basin as well.

The obvious market mechanism would be a subsidy from the government or other concerned groups to IV farmers for

every unit of water used in the Basin. The stakeholders in the Sea must determine how much it is worth to them to continue current water usage rates and thus to maintain current Sea levels and shorelines, that is, what is the value of every acre-foot runoff into the Sea. And they should offer that value as an incentive to farmers to maintain water usage rates. If that value and the benefits to the farmers themselves exceeds the coming market price of water, then current water usage rates in the Basin will be maintained (or at least, they will be curtailed) by only the amount of the IV-SD transfer already agreed to.

Of course, it may be that various community groups want to flat out ban the transfer politically. Besides being distasteful in a democratic society, such a ban ignores the possibility that the water transfer--and increased water conservation in the Salton Basin--may indeed be the most efficient social course. It will take voluntary, incentive-driven decisions and time offer of a subsidy to decide this for sure.

In the parlance of the Coase Theorem, court decisions have already decided where the rights to the water lie. At least the offer of a subsidy for water usage will be necessary to determine what the best use of the water is. Again, this course will also determine how the allocation would have proceeded regardless of who owned the water rights.

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**ACKNOWLEDGMENT**

In drafting this report, we benefited from helpful comments from Professors John Letey and Chris Amrhein of UCR, from Dr. Rodney Smith of Stratacom, Inc. and from Arnold Smith of Global Planning and Resources. However, the reader should be aware that the opinions expressed here reflect those of the authors and not necessarily those of the individuals mentioned, nor are they responsible for any errors in this report.

**CONCLUSIONS**

This analysis has really just applied the same points to water resources that were applied last month to labor resources. In this late-20th century society, there is no such thing as excess resources: available labor and available water are both scarce commodities. Analyses or decisions which fail to incorporate the alternated uses or opportunity costs of both are inevitably flawed.

In their consideration of a water transfer to San Diego, IID interests may not be

fully incorporating the interests of the Salton Sea. However, in ignoring the costs of diverting water to the Salton Sea, local community or environmental groups are equally short-sighted. In an age of scarce resources, all interests and costs must be considered in making an efficient, rational decision on resource allocation.

The same can be said for the Salton Sea restoration project as a whole. The very existence of the Sea and its problems is an accident that has arisen from a complex multitude of factors. The

decision as to whether and how to restore the Sea must be made upon considering a similarly wide and complex range of factors. What restoration projects should be undertaken? What stabilized Sea level can be justified? Whence can water supplies best be procured to achieve this level? These and other decisions have to be made mindfully of each other and mindfully of all competing uses of scarce resources (labor, capital, and natural resources) if the "correct" decision on the Sea is to be achieved.

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