Planning for a Database of New Mexico Water Rights Prices

Final Report
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Note: This project will be continued as a NM.WRRI seed grant under the direction of Frank A. Ward. The project will culminate in a final report that will be published by the NM WRRI

TABLE OF CONTENTS

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1. Background

The transfer of water rights is an important method for stretching available water supplies to meet new demands and to support sustained population growth and economic activity in the Rio Grande Basin. Sellers are typically water right owners currently using the water for irrigated agriculture. Buyers are typically cities, industrial parks, or other commercial activities. Potential sellers are unsure of what price to charge for a water right, while buyers are unsure of what price to pay. This lack of information on water right prices creates an uncertain and unpredictable market, which makes it more difficult to transfer water rights to meet growing demands. Improved understanding of the economic forces influencing water right prices will help buyers, sellers, and will add vital information to support continued economic development of the region.

This project will assemble water rights market data as a basis for a possible future economic model developed that explains factors affecting water rights prices for the Lower Rio Grande Basin (LRG). With the success of the LRG model, the same process can be applied to other basins in New Mexico where similar development pressures are increasing demands for scarce water. The goal of this project is to develop a water rights database that can be used to characterize the price of water rights in the Lower Rio Grande Basin. This database will contain actual verified transaction data that can serve in the future assembly of an economic model for the basin.

2. Previous Work

Previous analyses were searched for insight on water rights price. Several secondary research papers on water rights were reviewed. “Water Rights Heterogeneity and Price Determination: How Market and Product Attributes Affect Agricultural Water Market Prices” and “Managing Drought through Water Markets: Farmer Preferences in the Rio Grande Basin” by Rene Hadjigeorgalis that will be used in the study. Also, “Trends in Water Market Activity and Price in the Western United States,” “The Value of Water Rights in Western Kansas,” and “Giving Color to Oregon’s Gray Water Market: An Analysis of Price Determinants for Water Rights” were reviewed.

Hadjigeorgalis (Hadjigeorgalis 2002b) concluded that water rights are not a homogeneous good and their attributes and the unique characteristics of the market in which they are transacted will affect the price. Hadjigeorgalis employs the Hedonic method because it is based on the realization that some goods or factors of production are not homogeneous and can differ in numerous characteristics. Once these marginal characteristics’ prices have been estimated, they can then be used to analyze the underlying demands for the different characteristics of a good. The author also defines two types of attributes: market and product characteristics.

A more recent article by Hadjigeorgalis (2008) concluded that farmers preferred short-term water mechanisms such as spot water markets and water banks. Also, farmer

attributes and property attributes may be a greater indication of participation in different water market mechanisms than farmers' intended participation. Buyers and sellers do not differ in the market mechanisms that they prefer.

Hadjigeorgalis (2008) also notes the differences between buyers and sellers among surface-water rights and ground-water rights. For surface water, the sellers tended to be small-acreage farmers with limited resources, limited access to technology, and poor access to credit and liquidity. The buyers of surface-water rights tend to be farmers who produce on a larger scale with greater on-farm irrigation technology. The opposite holds true for ground water. The author also notes that little research has been conducted on how factors and various attributes influence farmers' participation in water markets.

Tom Brown (2006) concluded that spot markets are more active than permanent water right sales because of the lower transaction costs, fewer constraints, and the fact that it is short term. However, when water rights do sell, irrigators tend to be the most common sellers and municipalities are the most common buyers. Prices paid for municipal water tend to be higher than other water uses. Brown emphasizes that the value of water varies geographically and over time so caution must be employed when using market prices to analyze policy.

The analysis by Bill Golden (2004), conducted in western Kansas, states that the probability of selling a water right increases under the following conditions:

- seller has more off-farm income
- a high discount rate
- a short planning horizon
- a lower economic value of farming

Also, sellers refuse to sell water rights when they are concerned that the government will receive a financial windfall by reselling the rights to either the municipal or industrial sector. Water rights reallocation is difficult because of technical, legal, and political constraints. Absence of a market for water causes two problems: 1) efficiency gains are lost due to the difficulty of reallocation and, 2) price signals necessary for reallocation are absent.

Golden also uses the Hedonic method to price water rights and indicates that pricing of water rights apart from land uses depends on the:

- size of share (quantity)
- reliability (seniority)
- transportation costs (to new diversion point)

Clay Landry's (1995) thesis provides the process he used to receive real water market transaction data. Landry provides suggestions on how market information could be collected through surveys and existing databases. Landry indicates that water-use efficiency and crop production are increasing the value of the remaining stocks of water faster than the aquifer is being depleted, thus, declining aquifers have no bearing on prices.

3. Method

Project's goals were met by addressing the expected availability of water and its prices, developing a water rights database of past water right sales, using this database to develop a model that explains the price of water rights based on factors that affect their supply and demand, and developing a forecast model to help forecast future water right prices.

Secondary research helped with background information and also was used as a guide to follow when building the model. The economic concepts derived from the secondary research were the foundation for further study when building the forecast model. Also, two existing databases were used to help gather real market transactions: the Lower Rio Grande Basin database and the Office of the State Engineer's WATERS database.

Two key relationships pertaining to this project were built during the spring semester; one with professor emeritus Dr. Lee Brown from the University of New Mexico, and the other with a senior water resources specialist with the Office of the State Engineer.

3.1 Lower Rio Grande Basin Database

A detailed and exhaustive water market database was donated to this project by Dr. Lee Brown, The Lower Rio Grande (LRG) Water Market database consists of the names of sellers and their buyers, sale date, change date, each OSE file number, move from acres, diversion acre-feet, move to consumptive use, whether the sale of land was with a water right, whether a surface right was included, price per acre-foot, and total value of sale. The information in each category pertains to the buyer and seller of a particular transaction.

The LRG water market database contains 74 transactions with sale prices on 24. Dr. Brown gathered transaction information from the WATERS database and filled in any missing data by visiting with staff of the OSE in Las Cruces or through direct inquires. This was done to ensure that all transaction data were complete before he sought price information.

After obtaining all transaction data, Dr. Brown then solicited price data. This was done by word of mouth or through newspapers. By talking with individuals, Dr. Brown was able to track down the transaction from what he was told. In newspapers, interviewees will sometimes quote a price and depending on who made the quote or the time frame referenced, Dr. Brown could deduce the specific transaction being referred to. However, Dr. Brown stated that the most productive sources of price data are brokers, appraisers, attorneys, or direct solicitations to the participants of each transaction.

After ensuring he had complete data, Dr. Brown contacted the potential participants of the sale directly. He would send a letter that introduced himself and his purpose (see appendix for sample letter). Dr. Brown then followed up with a telephone call. This was done not only to verify the transaction and its participants, but to also try and solicit the water right's selling price.

3.2 New Mexico Office of the State Engineer Database

The WATERS database is housed on the New Mexico Office of the State Engineer's website. The database was created to store and make available any information pertaining to water right paper files. The database secures and maintains these files in one safe location and provides easy access to the information over the web.

Using WATERS, anyone can obtain instant information concerning water use, including comprehensive data about domestic, irrigation, commercial, and other water rights, location of rights, and owners of rights, as well as details of well construction.

3.3 Meeting with Staff of the New Mexico Office of the State Engineer (OSE)

Meeting with a water specialist at the OSE in March 2008 was very helpful. The specialist gave a brief tutorial on how the WATERS database worked, explained what the WATERS database was used for, and offered to be a point of contact for the project. He demonstrated how new users could register by using their email address. Once registered, the email address is used to log into the system and the user can begin querying the database. Because this project's focus is on transaction data, clicking on the "POD/surface reports and downloads" link is most appropriate. The user then chooses the specific basin from the pull-down menu entitled "basin." No other fields need to be completed. This project concentrates on the Lower Rio Grande Basin so the acronym "LRG" is chosen. Lastly, the user clicks on the "POD/surface data report" link. The result may take some time to load because transaction data along with its corresponding paperwork is being downloaded for the entire Lower Rio Grande.

3.4 Meetings With Previous Database Developers

A meeting in Albuquerque with Dr. Brown yielded an improved understanding of the Lower Rio Grande Basin Water Market database, which was derived from the WATERS database stored on the OSE website. This database will be used as the platform for the rest of the project. Dr. Brown also offered to be a point of contact if further clarification is needed pertaining to the database. He also offered additional support such as his methods of gathering market data and some sample letters that were used to acquire additional market information.

4. Plans for Future Work

Dr. Brown provided several tips for simplifying the development of our database. From his experience, he believes that the use of New Mexico Water Resources Research Institute (WRRI) letterhead in any correspondence would serve the project well because of the long history of excellent programs and high visibility the institute has developed with the water community. If not the WRRI letterhead, the Department of Agricultural Economics and Agricultural Business letterhead would also be excellent to use for project correspondence.

Brown noted that the project should start with an inventory of transactions and becoming familiar with the files contained in it. He further observed that during research of the files and interactions with the OSE staff, contact people involved in related organizations should be noted. These professionals, such as brokers, appraisers, and

attorneys, all deal in water rights transactions. He suggests a letter of introduction to these professionals, followed by a telephone call. These people may become an invaluable resource for the project.

The next step to updating Dr. Brown's database is to examine carefully Dr. Brown's database and to become familiar with its information and structure. That will be followed by securing names from likely water right sales transactions directly from the waters database. These names are public record and will be used as a starting point. If the evidence suggests that the water rights were sold, then contact information will be assembled. From this contact information, introduction letters and/or surveys will be sent to secure the transaction price where possible. If there is no response to the mailing, a telephone call will be made. The telephone call will either yield information on a water right selling price, the scheduling of a face-to-face meeting, or no information.

Also, another OSE point of contact is being pursued. This potential contact is very familiar with the WATERS database and with the water market and its participants in general. Meeting the person who inputs data into the WATERS database will assist with gathering market leads. This information will help considerably with updating the database. Contact information on those in the water rights business will be gathered throughout the project and used accordingly.

Finally, Dr. Brown will be notified of any new water right sales transactions that have occurred since his last recorded one. This not only coincides with an agreement with Dr. Brown, but also gives me the opportunity to match some of Dr. Brown's unmatched prices to potential transactions.

4.1 Next Steps

1) Become familiar with Dr. Brown's database by understanding how he obtained his information from of the OSE's database and asking him any questions that pertain to the data.
2) Use the OSE's database to secure names from likely water right sales transactions and obtain contact information.
3) Create and mail a letter and/or surveys to transaction participants to learn more information on the specific transaction.
4) If there is no response to the mailings, then telephone calls will be made to each participant.
5) If no new information is gathered from the phone calls, then a face-to-face meeting with each participant will be attempted.

NOTE: This project was undertaken during my undergraduate program. I am currently a graduate student in NMSU's AgEcon Department and this project will continue with a WRRI seed grant.

Appendix

December 5, 2005

Mr. XXXXX
Vice President & General Manager
Cemex El Paso, Inc.
1 McKelligon Canyon Rd.
El Paso, TX 79930-2634

Dear Mr. XXXXX:

To introduce myself, I am an economic consultant, based in Albuquerque, who specializes in water resources. I am trying to construct a historical series of prices paid for ground water rights in the Lower Rio Grande region of New Mexico and have been reviewing the Office of the State Engineer (OSE) files in that connection. I found documents there reporting that Jobe Concrete Products, Inc. purchased water rights in the Lower Rio Grande on several occasions under OSE File #LRG-7661 and that Cemex El Paso is now the owner of those rights. I am writing to request your assistance in ascertaining the prices paid for the acquired rights.

Specifically, I found three transactions as follows.

1. LRG-667AA into LRG-7661, 15.44 acre-feet of consumptive use rights obtained from Ms. Husta Oth on or about July 25, 1994.
2. LRG-8355A into LRG-7661, 21.23 acre-feet of consumptive use rights obtained from the Pai Family Limited Partnership on or about 1/11/1996.
3. LRG-1794 into LRG-7661, 150 acre-feet of consumptive use rights obtained from DeGraaf Farms on or about July 10, 1998.

I realize that this information is private and that the transactions occurred under previous ownership. However, in the hope that you will be able to assist me in determining the price paid for those water rights, I plan to call you soon at 915-565-4681. Thank you for your time.

Sincerely,

December 3, 2005

Ms. XXXXX
Mesquite MDWC & MSWA
P.O. Box 349
Mesquite, NM 88048

Dear Ms. XXXXX:

To introduce myself, I am an economic consultant, based in Albuquerque, who specializes in water resources. I am trying to construct a historical series of prices paid for ground water rights in the Lower Rio Grande and have been reviewing the Office of the State Engineer (OSE) files in that connection. I found documents there reporting several past purchases of rights by Mesquite Domestic Water Consumers Association and am writing in that regard.

The file associated with the purchase of 42.548 consumptive use rights from Husta Oth in 1995 (OSE File #667-A) contained a record that the purchase price was $1,400 per acre-foot. I found an additional five changes in ownership and/or purpose of use, but none of the other files contained price information.

1. LRG-4231 into LRG-3338, 80.633 acre-feet of consumptive use rights (161.266 acre-feet of diversion rights), obtained from Juan Singh on or about May 2, 1990.
2. LRG-7679 into LRG-3338, 75 acre-feet of diversion rights, obtained from the Santa Tomas Produce on or about May 6, 1991.
3. LRG-7672 into LRG-3338, 8.5 acre-feet of diversion rights, obtained from the Santa Tomas Co-op Gin on or about April 30, 1991.
4. LRG-5473 into LRG-3338, 10.86 acre-feet of consumptive use rights (21.72 acre-feet of diversion rights) obtained from Ruben Gonzales on or about March 11, 1996.
5. LRG-4287A into LRG-3338, 11.58 acre-feet of consumptive use rights (23.16 acre-feet of diversion rights) obtained from David Herrera on or about November 14, 1996/

It would appear that Transactions #2 and #3 did not involve a payment for the rights. Of course, if this interpretation is incorrect, I would appreciate having it corrected. In the hope that you will be able to assist me in determining the prices paid for the water rights, I will call you soon at 505-233-3947. Thank you for your time.

Sincerely,

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