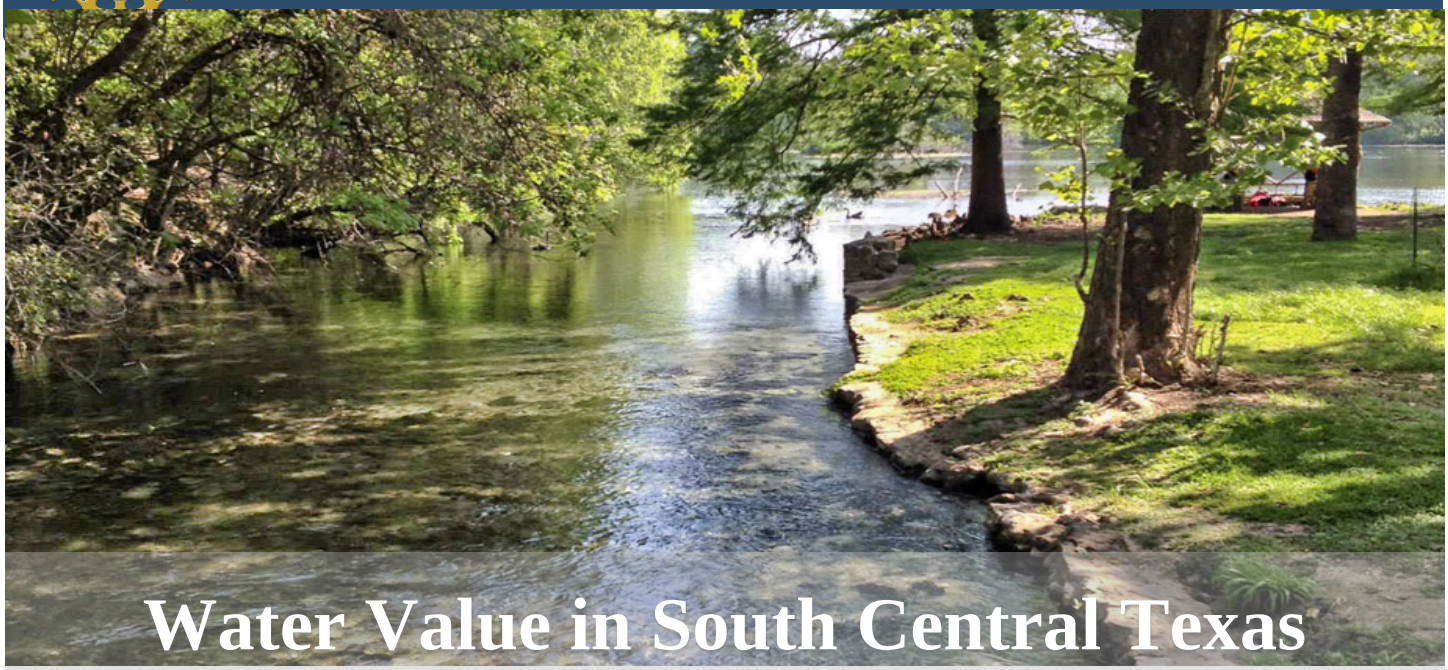
Practice Brief

November 2019



Water Value in South Central Texas

South Central Texas[1] faces a significant projected water deficit, and regional water reallocations are occurring. While water value (the cost to get or save one acft water) varies among sectors. Water ownership and water usage are the factors in determining water values. In this policy brief, we will compare the values of water in different sectors and the potential benefit of building a water market.

KEY MESSAGE:

- Water has different values in different sectors. Value is highest for hydraulic fracturing (fracking), then for power plant cooling and M&I sector, with the lowest for agriculture.
- Substantial Edwards Aquifer water transfers have occurred from agriculture to municipalities. Rules have resulted in higher values in M&I and the San Antonio Pool.
- Water costs from water projects are much higher than many use values.
- Higher demand in the peak period, like mid-summer and drought season requires the water supplier have enough firm yield to meet the demand, which increases the cost of water
- Climate change and population growth are two potential factors are likely to worsen the water situation in the region and raise prices

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Full Article:

Fei et al.(2019). Water Value in South Central Texas, Unpublished Manuscript, Texas A&M University, College Station, Texas

WATER VALUES BY SECTORS

- Agricultural sector: When irrigated land is rented, it typically involves access to property wells but does not come with irrigation equipment or any offset of water pumping cost. We thus can estimate water value by dividing the difference in land rental rates between irrigated land and dryland by average water use. The result shows annual agricultural water use value ranges from $6 per acre foot to $98 per acre foot with lowest in the Nueces Delta and highest in the Winter Garden Region.
- Municipal water rates range from $1,100 to $2,200 per acre foot and the industrial rates from $1,300 to $3,330 (Texas Municipal League 2018). This is the price for delivered treated water. Considering treatment and distribution cost are around $600-$1000 per acre foot so raw water low end values are about $700.
- Cost of converting the electrical generator cooling method from recirculating cooling to dry cooling ranges from $934 to $8,215 per acre foot, estimated by Yang (2019). Developing new plants with dry cooling costs about $2,268-$4,100 per acre foot saved.
- Hydraulic fracturing (fracking) delivered water ranges from $54,264 to $219,380 per acre foot in the Permian Basin with $2,327 to $6,207 of that arising for raw water procurement. Recycling produced water costs about $31,000 to $139,000 per acre foot (Vargas, forthcoming).
- Water projects that have been built to provide supply to San Antonio generate water that ranges in annual cost from $173 to $3,012 per acre foot.
- Edwards Aquifer Water Market leases on average for $103-$112 per acre. Permit sale values are about 20 times higher. The estimated water value in terms of agricultural region payroll data is about $554 per acre foot.

COMPARATIVE WATER VALUES

Water has different values in different sectors. This comes about in part, because water transfers are limited by: a) costs and the availability of means of conveyance or natural water movement; b) water availability; c) existing water rights of surface and Edwards Aquifer water; d) right of capture laws for much of the groundwater; e) transfer restrictions in the Edwards market rules; f) leasing versus sales possibilities; g) the lack of a clearing house where buyers can find sellers; and h) a lack of active markets operating for the rivers.

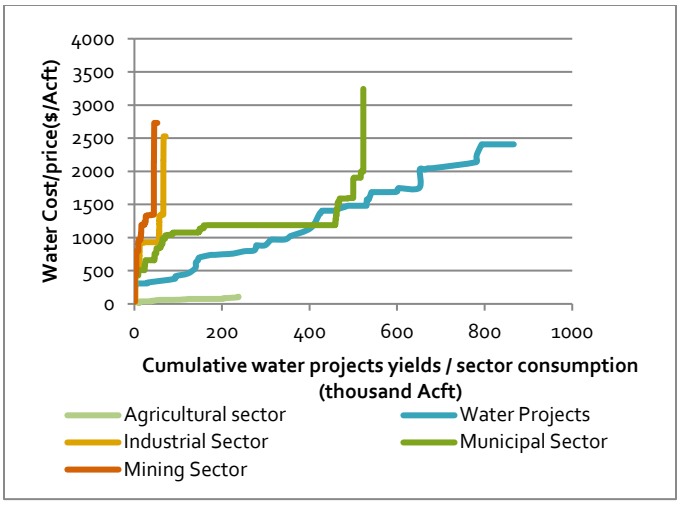

Figure 1: Potential water project supply and sector consumption vs water prices

Figure 1 presents the cumulative water consumption amount and the raw water prices by sector and water project yields vs costs. Municipal consumption is largest followed by agriculture. Proposed water projects are higher in cost. Agriculture water value is smaller than in other sectors. Building a more comprehensive water trading market plus adding conveyance infrastructure might allow further water transactions lowering M&I water stress but would likely reduce rural area economic activity at a rate of about $450 per acre foot transferred potentially requiring forms of compensation.

- As is well developed in TWDB documents population growth will stress regional supplies and likely raise prices. Climate change is also projected to worsen things increasing demand and lowering supplies.
- Allowing more free water trading in a broader joint river and aquifer water market might help reduce water deficit stress and lower the high prices while increasing agricultural income. But this would come at cost of rural economic activity.

References

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