Institutional Barriers to Water Conservation, Rio Grande Basin

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Road Map

- Water Conservation Economics
  - Conservation barriers
  - Conservation incentives
- Producer Survey
  - Identifies current / potential water use patterns
  - Some results
- Policy Implications

Water conservation concepts

Economic Principle of Conservation

- Voluntary water conservation requires the potential for economic gain
- People will only reduce water use if their benefits exceed their costs

Economic Incentives and Disincentives for Conservation

- Disincentive: do you own saved water?
  - Discourages water transfers
  - Discourages water conservation

- Incentive: what promotes transfers from ag to M&I?
  - Banking could provide cash for agriculture
  - Water is available when cash is on the table
  - Cities will pay top dollar for banked water in a drought
  - Barrier: Will fear of forfeiture to 'non-beneficial use' impair incentive to transfer?

What is water conservation in agriculture?

- Reduced on-farm use

- Increased water for basin

High on-farm use

Flood Irrigated Orchard

Reduced on-farm use

Drip Irrigated Orchard

Reduced applications v. net savings

- Guard against on-farm water savings that fail to save the basin's water
  - A common belief: reduced on-farm water applications supply more water for basin
  - Switching from flood to drip may reduce on-farm application by X but also reduce return flows by X.
  - Good laws assign a water right to individual actions that increase the basin's net saved water.
    - Reduced on-farm water application is nice
    - Reduced water losses to basin provide new supplies

Economics of Net Savings

- (net loss) Re-using on-farm return flows is not a net savings, since it reduces downstream supply.
- (net savings) Preventing seepage to uneconomical depths or to saline aquifers is a net savings.
- (policy) Economically sound policies will encourage net savings and make it easy to show.

Institutional Barriers

- Surface-groundwater substitution
  - Reduced surface water use may increase gw use
  - Good policies will encourage conjunctive management.
- The uncertain duty of water
  - NM OSE is making offers for irrigated land on lower RG
  - Duty of water: issues and future
- Common Property Carryover Storage
  - Some producers would carry over with right incentives
  - Common property carryover – 57% (NM), 43% (TX)
  - This year's saved water is shared by all

Institutional Barriers: Interstate Compacts

- RGR Compact makes no provision for CO or NM to rent surplus water below Elephant Butte (under-deliver for cash)
- 1906 U.S. Mexico Treaty makes no provision for NM/TX to over-deliver to Mexico for cash.

Institutional Barriers: The Price of Water

- Buying price may influence water conservation
  - EBID membership charge
    - 0-2 af/ac = $50 / acre cost = $0 cost for water
    - 3rd af/ac = $18 / af
    - Low buying price may lock water into agriculture and discourage conservation

- Selling price may influence water conservation
  - Would producers respond to opportunity to market any of those 1-3 acre feet outside agriculture or outside the state?

Summary: Potential Institutional Barriers to Agricultural Water Conservation

- Overriding role of economic incentives
  - On farm savings that save no water basin-wide
  - Difficulty of securing rights to conserved water
  - Groundwater substitution for conserved surface water
  - Lack of clear titles to water rights
  - Common property carryover storage
  - Interstate compact constraints
  - The buying/selling price of water

Producer Survey

Some Questions

- Identify Acreage Farmed
  - Land ownership status
  - Number and size of fields
  - Fragmentation
- Identify water use patterns by crop
  - Crops in 3 largest fields
  - Water source
  - Timing and amount of water applied
- Water use patterns
  - current
  - potential

Some Results

Barriers to Reduced Water Use

	yes (pct)	No (pct)
I need all the water I receive	62.81	37.19
Water conservation is too expensive	18.18	81.82
Build up of salts in the soil	14.91	85.09
No financial incentive to conserve	11.67	88.33
Water conservation takes too much labor	13.22	86.78
On-going adjudication	8.33	91.67
The distribution system restricts me from conserving.	7.02	92.98
I cannot find a buyer for saved water	0.83	99.17

Sample = 121 NM Irrigators

More Results

Could sell this year's allotment $100 / a-f	Could sell indefinitely at $100 / a-f	Could sell this year's allotment $200 / a-f	Could sell indefinitely at $ 200 / a-f
▪ Reduce water use ▪ apply less water to less land	▪ Reduce water use ▪ apply less water to less land ▪plant some water-saving crops ▪Lease less land	▪ Reduce water use ▪ apply less water to less land ▪ plant more water-saving crops ▪Lease no land	leave farming

Policy Implications

Can water be managed equitably, efficiently, and sustainably?

- Agriculture (maintain or improve farm income)
  - Adjudication
  - Storage
  - Groundwater development
- M&I Uses
  - Price basic needs cheaply
  - Price discretionary uses => Marginal cost

Summary: The West's Water

- A few good people

- And…