Improving Economic Returns & Long-Run Sustainability in a Rapidly Growing, Peri-Urban, Multicultural, Traditional Farming Community

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South Valley Project Components...

1. Socio-economics
   - Socio-economic characteristics of South Valley agriculture & irrigation
   - Economic impact of local agriculture
   - Marketing information for locally grown food

2. Technical
   - Crop water use
   - Land use & changes
   - Weather
   - Water quality
   - Microclimate effects of irrigated agriculture

3. Community strategic planning
   - Identification of ag irrigators’ perceptions of current ag issues & related social & environmental issues
   - Develop strategic vision for SV irrigated ag for the next five years
   - Identification of potential barriers & necessary strategies
Differing “visions” of what South Valley agriculture should be in the future…

<table>
<thead>
<tr>
<th>Status quo vision…</th>
<th>Alternative vision…</th>
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<tbody>
<tr>
<td>• Nice place to live</td>
<td>• Increased local food production</td>
</tr>
<tr>
<td>• Irrigated properties</td>
<td>• Intensified production</td>
</tr>
<tr>
<td>– Non-commercial</td>
<td>• High value crops</td>
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<tr>
<td>– Ag character</td>
<td>• Supply local market</td>
</tr>
<tr>
<td>• Ecological services</td>
<td>• Albuquerque’s</td>
</tr>
<tr>
<td>– Micro-climate</td>
<td>– Food Basket</td>
</tr>
<tr>
<td>• Lifestyle “ag” values</td>
<td>– Bread Basket</td>
</tr>
<tr>
<td>– Hobby, tradition</td>
<td>– Salad Bowl</td>
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<tr>
<td>– Recreational farming</td>
<td></td>
</tr>
<tr>
<td>– Household production</td>
<td></td>
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</table>
March, 1807

Both above and below Albuquerque, the citizens were beginning to open the canals, to let in the water of the river to fertilize the plains and fields which border its banks on both sides; where we saw men, women, and children of all ages and sexes at the joyful labor which was to crown with rich abundance their future harvest and ensure them plenty for the ensuing year. Those scenes brought to my recollection the bright descriptions given by Savary of the opening of the canals of Egypt. The cultivation of the fields was now commencing and everything appeared to give life and gaiety to the surrounding scenery.
Socio-Economic Component

1. Prediction of local consumers fresh produce preferences and likely buying behavior
   - Consumers prefer local produce, but less likely to buy local produce
   - Price-driven consumers prefer & are likely to buy non-local produce

2. Economic impact of agriculture in region is tiny
   - 0.5% of economic activity
   - 0.3% of employment

3. Most irrigated “places” aren’t enumerated in Census
   - ~400 irrigated farms in 2007 Census of Ag in Bernalillo County
   - 82% sell <$10,000 ag products per year
   - 68% are retirement or rural-residential farms
   - Alfalfa is primary crop
   - Very little reported high value crop production
   - Thousands of irrigated parcels (& irrigation district accounts)
   - But, very little is being produced
   - Are a handful of business-oriented farms, ag entrepreneurs
   - Informal economic activity – bartering
   - VERY low intensity “farm” management (low or no cost, low or no income)
What motivates the small-scale irrigators?

• Why are they engaged in small-scale irrigated ag?
  – Retired
  – Fun
  – Hobby, way to stay busy
  – Green space
  – 2° source of income
  – Food or feed
  – 1° source of income (2 respondents)

• Their objectives are to
  – Preserve agricultural lifestyle
  – Keep costs of agricultural lifestyle low
  – Increase income from agriculture (the minority response)
Technical Component

- **On-farm research**
  - Installed weather stations & flux tower
  - Measured alfalfa ET using eddy covariance methods
  - Developed alfalfa crop coefficients
  - Assessed on-farm (field) irrigation efficiency (35 fields)
  - Assessed soil quality
  - Assessed irrigated water quality

- **Remote sensing of crop water use**
  - Applied existing energy balance model to South Valley
  - First broad scale estimates of crop ET
  - ET theory vs. real world water use
  - Assessing basin wide depletion
  - Combining with existing yield functions
  - Estimate economic returns
Irrigation
### South Valley land use & cover change, 1990-2010

<table>
<thead>
<tr>
<th>Land Cover Type</th>
<th>% Change 1990-2010</th>
<th>Change in Km² 1990-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>111.23</td>
<td>79.10</td>
</tr>
<tr>
<td>Agriculture</td>
<td>-19.81</td>
<td>-21.91</td>
</tr>
<tr>
<td>Water</td>
<td>5.89</td>
<td>0.43</td>
</tr>
<tr>
<td>Shrubland</td>
<td>-14.06</td>
<td>-110.52</td>
</tr>
<tr>
<td>Vegetated Urban</td>
<td>45.75</td>
<td>52.89</td>
</tr>
</tbody>
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**Legend**
- Urban
- Agriculture
- Water
- Shrubland
- Vegetated Urban
- South Valley
- City Boundary

**Change Detection 1990 - 2010**
Albuquerque, NM

**10 August 1990**
- Urban or Built-Up Land
- Agricultural Land
- Water
- Rangeland
- Vegetated Urban

**17 August 2010**
- South Valley Study Area
- Albuquerque

**Projection:** UTM, Zone 13S, WGS 1984
Land surface temperature, ABQ metro area, 29 May 2010

Land surface temperature, ABQ metro area, March – Dec 2010

Air temperature, 29 July 2010, South Valley vs. Built-up ABQ

Micro-climate effect of irrigated agriculture on the urban fringe
Strategic Planning for the Future of South Valley Irrigated Agriculture

- Participatory research process
- A previous community strategic planning process led to current AFRI project
- We did community referencing (2009 – 2012)
  - Identified individuals in the community interested & willing to participate in the planning process
  - Snowball methods
  - Interviews & conversations with stakeholders
  - Kept them informed about project
- Integration workshop held 19 October 2012 in the South Valley
  - An intense, day-long activity
  - ~20 participants
  - Project activity report sent to the community September 2012
  - Planning report sent to the community February 2013