



Map of study sites in Alcalde, El Rito, and Valdez in northern New Mexico. Public land grazing allotments administered by the United States Forest Service or the Bureau of Land Management surrounding each of the acequia farming sites are shaded in different colors to show spatial extent.

The role of livestock-raising in the resilience of acequia communities of northern New Mexico

This survey is part of a broader project funded by the National Science Foundation and conducted by New Mexico State University, University of New Mexico, New Mexico Tech, Sandia National Laboratories, and the New Mexico Acequia Association entitled **“Acequia Water Systems Linking Culture and Nature: Integrated Analysis of Community Resilience to Climate and Land Use Changes”**

We are soliciting your input to help us understand the connection between acequias and livestock-raising in northern New Mexico. Individual surveys will be kept confidential and anonymous. Only compiled results will be shared broadly among the agricultural community. Conclusions will be made available to policy makers. If you have any questions or concerns please contact Dr. Sam Fernald, Principal Investigator (575-646-1041) or Dr. Andres Cibils (575-646-4342).

Part 1 - Please tell us about yourself

1. Please indicate your age group
 - ☐ Under 25
 - ☐ 26-45
 - ☐ 46-65
 - ☐ Over 65
2. Please indicate your gender
 - ☐ Female
 - ☐ Male
3. How would you describe yourself?
 - ☐ I am a rancher
 - ☐ I am primarily a rancher but also do irrigation farming
 - ☐ I am primarily a farmer but also raise cattle to supplement my income
 - ☐ I am both a farmer and rancher
 - ☐ I retired from another profession and now ranch and/or farm
 - ☐ I am neither a farmer nor rancher; I raise cattle and/or farm as a hobby
4. Which of the following best describes you?
 - ☐ I am a first generation rancher/farmer
 - ☐ My family has been in ranching/farming for several generations
5. Which of the following activities contributes the most to your annual income?
 - ☐ Ranching
 - ☐ Farming
 - ☐ Off-farm/ranch employment

6. I am a member of
- ☐ One or more grazing associations
 - ☐ One or more acequia associations
 - ☐ Both acequia and grazing associations
 - ☐ Neither acequia nor grazing associations
7. Please indicate your level of participation in community organizations such as the local Fire Department, a Church, local Schools, or other similar organizations
- ☐ I am an active participant
 - ☐ I occasionally participate
 - ☐ I rarely participate
 - ☐ I never participate

Part 2 – Please tell us about your livestock operation

8. Which of the following best describes your livestock operation?
- ☐ I raise sheep and cattle
 - ☐ I used to raise sheep but now only raise cattle
 - ☐ I raise sheep
 - ☐ I raise cattle
9. If you raise cattle, which of the following best describes the size of your herd?
- ☐ Less than 5 head
 - ☐ 6 – 20 head
 - ☐ 21 – 50 head
 - ☐ More than 50 head
10. If you raise sheep, which of the following best describes the size of your flock?
- ☐ Less than 25 head
 - ☐ 26 – 100 head
 - ☐ 101 – 250 head
 - ☐ More than 250 head
11. If you raise cattle, do you run
- ☐ A cow-calf operation
 - ☐ A yearling operation
 - ☐ Both

12. In the last 15 years has your herd/flock:

- ☐ Increased
- ☐ Stayed the same
- ☐ Decreased slightly
- ☐ Sharply decreased

13. If you wanted to increase the size of your herd/flock, which would be the single most important factor that limits your ability to do so?

- ☐ Livestock prices
- ☐ Access to summer grazing lands
- ☐ Access to winter grazing lands
- ☐ My ability to grow or purchase hay to feed livestock during winter months
- ☐ Droughts
- ☐ I am satisfied with the number of livestock I currently own, I do not want to increase my herd/flock size

14. Please help us understand how you cope with droughts

- ☐ I store emergency hay reserves to feed during a drought
- ☐ I have reserve pastures that my livestock graze during a drought
- ☐ I purchase hay and or lease additional grazing land when a drought occurs
- ☐ I sell some of my livestock
- ☐ I do all of the above

15. Where do you graze your livestock?

- ☐ On public lands in both summer and winter
- ☐ On public lands in summer and private irrigated lands in winter
- ☐ On public lands in summer, and both private irrigated and public lands in winter
- ☐ On private lands

16. If you lease public grazing lands, how far from your base property do you graze your livestock?

- ☐ Less than 10 miles
- ☐ 11-30 miles
- ☐ 31-60 miles
- ☐ More than 60 miles

17. If you lease public grazing lands, do you hold:
- ☐ An individual permit on your grazing allotment (in other words, only your livestock graze this allotment)
 - ☐ Hold a partial permit on the grazing allotment (in other words, your livestock is part of a multiple-owner herd/flock grazing one allotment)
18. If you hold a partial grazing permit on your grazing allotment, are you and other ranchers that graze this allotment:
- ☐ Organized as a grazing association
 - ☐ Not organized as a grazing association
19. Which of the following best describes your day-to-day involvement in your livestock operation?
- ☐ Hands on, I check and work my livestock, and make all management decisions
 - ☐ I receive help from neighbors and relatives but make all management decisions
 - ☐ I hire someone to do most of the work but make management decisions
 - ☐ Hands off, I delegate most of the work and management decisions
20. Which of the following best describes the involvement of your family in your livestock operation?
- ☐ My family helps check and work livestock regularly
 - ☐ My family helps check and work livestock occasionally
 - ☐ I receive no help from family members
21. If you raise cattle, which of the following best describes your strategy to market your livestock?
- ☐ The beef I produce is used mostly for family consumption
 - ☐ I sell livestock to relatives and friends
 - ☐ I sell livestock in local and regional markets
 - ☐ I trade livestock for other goods or services
22. If you raise sheep, which of the following best describes your strategy to market your livestock?
- ☐ The lamb/mutton I produce is used mostly for family consumption
 - ☐ I sell lamb/mutton to relatives and friends
 - ☐ I sell lamb/mutton in local and regional markets
 - ☐ I trade lamb/mutton for other goods or services

23. If you raise sheep, which of the following best describes your strategy to market your wool?
- ☐ The wool I produce is processed by my family to create handcrafts
 - ☐ I sell wool to relatives and friends
 - ☐ I sell wool in local and regional markets
 - ☐ I trade wool for other goods or services

Part 3 – Please answer the following questions if you both ranch and farm. Otherwise, please proceed to Part 4

24. Which of the following best describes the size of your irrigated farming operation?
- ☐ 1-5 acres
 - ☐ 6-10 acres
 - ☐ 11-20 acres
 - ☐ More than 20 acres
25. Which of the following best describes your farm production?
- ☐ I grow hay to feed my livestock
 - ☐ I grow hay to sell in the local or regional markets
 - ☐ I grow other crops and buy hay to feed my livestock
 - ☐ I neither grow crops nor hay, my farm is my family residence
26. If you had to sell off all your livestock, would you:
- ☐ Continue to grow hay for sale in the local or regional markets?
 - ☐ Grow other crops?
 - ☐ Give up farming but would hold on to your irrigated farmland?
 - ☐ Sell your irrigated farmland?
27. If you are a member or an acequia association, does this membership
- ☐ Have a positive influence on your livestock operation? *(for example, opportunities to market animals, possibility of borrowing or purchasing less expensive hay, opportunity to find help)*
 - ☐ Have neither positive nor a negative influence on your livestock operation?
 - ☐ Have a negative influence on your livestock operation? *(for example, competing demands on your time)*

Part 4 - Please tell us how much you agree with the following statements

	Completely Agree	Mostly Agree	Neither Agree nor Disagree	Mostly Disagree	Completely Disagree
28. In my experience, livestock provide a more stable source of income compared to irrigated crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. I raise livestock because it is a family tradition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. An important reason for owning irrigated land is to qualify for a permit to graze my livestock on federal lands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. My children or grandchildren will most likely take over my ranching/farming operation after I retire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. I learned most of the skills I needed to successfully operate my farm/ranch from my parents or grandparents or other family members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Coding of questionnaire responses for analysis

1. Demographics

Age: < 25, 26-45, 46-65, >65

Gender: male, female

Self ID: Farmer, Rancher, Both, None, Retired;

Heritage: First generation, multiple generations

Livelihood Source: Ranch, Farm, Off-Farm, Retired;

Affiliation: Acequia association, Grazing association, Both, None;

Community Participation: Rare, Occasional, Frequent.

2. Enterprise characteristics

Livestock: **Kind** (cattle, sheep, both)
Herd size (<20; 20-50; or > 50 head)
Flock size (<25; 25-100; or >250 head)
Cattle operation type (yearlings, cow-calf, both)
Herd size change (same, increased, decreased)

Grazing: **Kind of lands** (public, private, both)
Miles to grazing lands (< 30; or >30)
Permit type (joint, individual, both)¹

Labor: **Hands on involvement** (yes, no, or mix)
Family help (yes, no, or sometimes)

Marketing Strategy: **Cattle** (sales barn, relatives, or mix)
Sheep (sales barn, or relatives)
Wool (sales barn, or relatives)

Base Farm Property: **Farm acres** (<5; 5-20; or > 20)
Farm production (hay for sale, hay for sale, other/no crops)

3. Strategies

Drought coping: sell livestock, feed reserves, buy feed, multiple;

If livestock were liquidated: sell land, hold fallow land, grow hay for sale, grow other crops;

Factors limiting herd growth: winter feed, summer grazing, drought, multiple factors, satisfied with current numbers.

4. Perceptions

Factors affecting herd growth (winter feed, summer grazing, drought, multiple factors, satisfied with current numbers)

Livestock provide a more stable source of income compared to irrigated crops. (Agree, neutral, disagree)

I raise livestock because it is a family tradition (Agree, neutral, disagree)

An important reason for owning irrigated land is to qualify for a permit to graze my livestock on federal lands. (Agree, neutral, disagree)

My children or grandchildren will most likely take over my ranching/farming operation after I retire. (Agree, neutral, disagree)

I learned most of the skills I needed to successfully operate my farm/ranch from my parents or grandparents or other family members. (Agree, neutral, disagree)

¹ A question about grazing associations in this section overlapped with one of our demographics questions and was excluded from analysis.