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Results of a Rapid Appraisal Study: Agricultural Producers' Perceptions of Drought Vulnerability and Mitigation—Howard County, Nebraska

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Results of a Rapid Appraisal Study

Agricultural Producers' Perceptions of Drought Vulnerability and Mitigation—Howard County, Nebraska

Introduction

Drought is the leading natural disaster in the United States in terms of monetary losses. The National Research Council (1995) estimates that drought costs the United States an average of \$6–8 billion per year. Because of these losses and the great effects of drought on many citizens' quality of life, drought planning is gaining widespread support in the United States. However, U.S. drought planning within the agricultural sector has historically focused on response measures that help producers, primarily farmers, deal with and recover from drought. It has been found that these often ad-hoc drought responses are very expensive and do little to reduce ongoing drought vulnerability (Wilhite, 1997).

Subsequently, current national drought planning efforts, as discussed in *Preparing for Drought in the 21st Century* (National Drought Policy Commission, 2000), have shifted to an emphasis on drought mitigation programs—that is, modifying operations before a drought strikes in order to reduce the impending negative impacts. In terms of agricultural drought planning, these programs necessitate increased communication between agricultural producers, private businesses, and government planners.

Since its inception in 1995, the National Drought Mitigation Center (NDMC) has striven to promote drought mitigation planning and increase the communication between federal, state, and local drought planners. Essential in these endeavors is input from agricultural producers that deal with drought at the “ground level.” Therefore, a study was undertaken to gain insight into agricultural producers' perceptions of current drought issues, which yielded valuable information on several topics, including perceptions of drought vulnerability, the use of climate forecast information, the implementation of drought mitigation measures, and the roles of external groups in drought planning.

The Study

A rapid appraisal study was undertaken by graduate students at the University of Nebraska as part of a

course project with cooperation from the NDMC and the University of Nebraska Howard County Cooperative Extension Service. The study focused on agricultural producers in Howard County, Nebraska, selected by a random sampling conducted by the Howard County Cooperative Extension Service. The research consisted of analyzing a mail-back survey and a focus group using a combination of qualitative and quantitative methods. The mail-back survey yielded 29 surveys containing a variety of closed and open-ended responses, while the focus group provided an in-depth discussion with four local producers. The study was completed in November 2000, which was seen as an opportune time since local producers had just experienced a severe drought over the previous year.

Selected Survey Findings

Survey respondents ranged in age from 35 to 78, with an average age of 53 years. Most operations could be classified as diversified, with a majority (74%) producing a combination of corn, cattle, and hay. Four operations irrigated 100% of their farmlands while three were completely dryland. The remaining operations irrigated 15–90% of their farmlands, with an overall average of 57%.

Drought Vulnerability

In general, most producers felt that they were moderately to highly vulnerable to the effects of drought (Figure 1). As expected, 54% of producers stated that having dryland pastures and crops was the main reason why they were more vulnerable to drought than other producers were. Many of these producers felt that they were doubly affected by drought through poor pasture grass production and crop losses. Although a mix of cattle and crop production is a standard dryland adaptation, it may enhance the perception of drought vulnerability. In addition, some farmers stated that even though they irrigate, poor wells, uncertain surface water sources, sandy soils, and reliance on gravity irrigation (as opposed to pivot irrigation) made them more vulnerable than other irrigators.

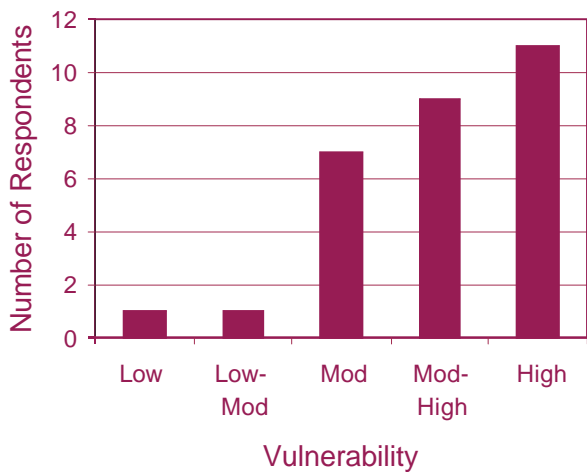


Figure 1. Drought vulnerability.

Nebraska drought researchers, such as Wilhelmi (1999), have modeled local drought vulnerability based on irrigation, climate, soils, and crop type. When asked to rank a range of drought vulnerability influences, survey respondents recognized the importance of these factors but also ranked capital reserves and soil conservation practices as equally important (Table 1). Focus group participants also cited the importance of irrigation type and crop diversity in determining vulnerability. This study suggests that, although more difficult to assess, other vulnerability factors such as capital reserves, the diversity of crops grown, type of irrigation, and soil conservation measures should also be included in future modeling efforts when possible.

Weather Information and Forecasts

Surveys showed that most producers receive their weather information from television (97%) and radio (93%), followed by Digital Transmission Network services (35%), newspapers (28%), friends/neighbors

Amount of irrigation	2.8
Climate	3.3
Soil conservation practices	4.2
Type of crop(s) grown	4.3
Amount of capital reserves	4.3
Soil types	4.8
Stocking rates	5.0
Hay or feed availability	5.5
Nonfarm income	6.6
Religion/prayer	6.7

**Ranked on a ten-point scale with “1” being the most important

Table 1. Average rankings of vulnerability determinants.

(21%), the Internet (17%), trade journals (14%), and the Farmer’s Almanac (3%). In terms of long-term drought forecast models, 64% reported having seen the U.S. Drought Monitor (2001) and 32% cited that they occasionally or regularly use it to make farming decisions. The statistics were nearly identical for the Climate Prediction Center forecasts (2001).

Use of Weather Forecasts

Thirty-one percent of respondents reported that they would not modify their farming operation if a drought were predicted in the next growing season. They consistently stated that this was due to the unreliability of the forecast products. One respondent also noted that they could not afford to modify their production.

On the other hand, 69% of the respondents reported that they would modify their operation through a variety of means. Instead of corn, operators would plant more soybeans, sorghum, and hay, especially on poor soils or on areas with less certain water supplies. Crops would be planted thinner for increased viability. Operators would also till less and use less fertilizer. Cattle producers would plant or acquire additional hay, silage, or pastures. Cattle stocking rates would also be adjusted or reduced. Some of the respondents suggested that some modifications may be based on forecast information while others may be undertaken during a drought as needed.

Limitations to Drought Preparedness

As a whole, producers cited many of the drought mitigation strategies recommended by the University of Nebraska Cooperative Extension Service (2000). However, each producer typically only reported implementing one or two of the suggestions in their own operation, as opposed to the multi-strategy approach envisioned by drought planners. As an explanation, 76% of operators cited many circumstances that prevent them from fully preparing for drought. These circumstances include a lack of capital reserves and the need to maintain cash flows, the unreliability of forecasts, and the lack of drought management experience.

In terms of capital reserves, operators reported that modifying operations to prepare for drought was expensive and some producers could not afford to purchase different types of tillage equipment, drill new wells, or install irrigation equipment. This was noted to

be especially difficult when landlords are inflexible in their leasing structure. Others also mentioned that the market also hindered many producers from switching to more drought-tolerant crops. “If you can’t sell sorghum, why produce it?” was the reply of one of the respondents. Several farmers noted that their operation must maintain cash flows to meet loan requirements and that they would look like poor managers if they planned for drought and it did not occur, especially those with low capital reserves. As one respondent stated, “with capital reserves low or none, you have to try and produce all you can if it should rain. You wouldn’t look good to your banker if it started to rain in July and you figured on a drought.” Finally, some producers stated that the main obstacles to drought planning are generally poor management practices. Some of these comments were based on the complexity of drought planning while others focused on the negligence of some producers.

Drought Response Assistance

Survey results indicate that these producers rely most on their families, communities, and churches to help them cope with drought situations (Table 2). This demonstrates the often-overlooked role that these groups play in helping people through hard times. Given the importance placed on finances in drought mitigation, it is no surprise that bankers and loan officers rank next, with the federal government close behind. State government, extension agents, trade and industry groups, and county/city governments played lesser and nearly equal roles.

Selected Conclusions and Recommendations

- **Drought Vulnerability Modeling**—Drought vulnerability modeling efforts such as Wilhelmi (1999) are essential for understanding and identifying local and regional vulnerability factors. When feasible, attempts should be made to incorporate other social and localized factors such as irrigation type, capital reserves, conservation techniques, and farm/ranch diversity into drought vulnerability modeling efforts for enhanced representations.
- **Drought Education**—Several respondents noted a lack of training and/or negligence as the primary limitation to drought planning, which stresses the continuing need for drought education. This study

External Groups	Average Rankings
Family and/or community support	2.25
Church or other faith community	1.93
Bank or loan officer	1.86
Federal government	1.79
Extension agent	0.85
State government	0.81
County/city government	0.59

** Ranked on a four-point scale with “3” being the most important

Table 2. Reliance on external groups during drought.

shows that the majority of operators receive weather information through television, radio, Digital Transmission Network services, and newspapers. Information products should be tailored for these media outlets along with other contemporary government outlets such as the Internet, public meetings, and mailings.

- **Enhanced Cooperation**—Although many farmers would make some modifications to their operations during drought, many are hesitant to fully commit to mitigation efforts because of their uncertainty about long-term weather forecasts and financial concerns. Enhanced three-way communication between producers, financial lenders, and drought planners may allow for a broader understanding of forecast benefits and limitations and “get everyone on the same page” in terms of financial needs and expectations for the long-term viability of local agricultural communities.
- **Production Markets**—Reliable and adequate markets for alternative crops must be established in order for many farmers to change planting strategies. There is a realization that many of these related issues are decided at the federal level, but it was suggested that state and local planners could provide incentives and help ensure local markets.
- **Rental Agreements**—Landlords and tenants should work together to develop flexible arrangements that increase the viability of the land and operation before and during drought. “Floating” rate structures on leases was mentioned as a particularly useful agreement to reduce drought risk.
- **Financial Assistance Programs**—Additional or more identifiable state, federal, and private incentives and

assistance programs may be needed to help operators implement capital-intensive mitigation and response measures. The National Drought Policy Commission (2000) cites roughly 80 federal and state drought programs. These programs should be marketed to local producers along with adequate technical assistance during the implementation and application process.

- **Social Assistance Programs**—Family, community, and church support is seen as essential in sustaining producers through periods of drought. Family counseling specialists and members of the clergy should be included in drought planning and response efforts. This is often stated as important in drought planning but rarely done.
- **Further Research**—Similar research should be conducted in other areas for a better understanding of regional drought variations.

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