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Chihuahuan Desert Grassland Conservation: Perspectives of Ranchers in Mexico



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Abstract

This report presents the results of a survey administered to ranchers in Mexico's Chihuahuan Desert, with the aim of learning about their opinions, experiences, and practices in the area of ranching and grassland conservation. A structured survey was distributed in both electronic form and hard copy. It consisted of open-ended, multiple-choice questions, and their rating, thereby allowing for both quantitative and qualitative analysis of the responses. The final sample included 172 participants, the majority of them located in the state of Chihuahua, followed by Durango and Coahuila, with a few respondents from other states as well. The respondents included ranchers who represented different property regimes, from private property to communal and ejido lands.

The results show that the ranchers preferred to learn through direct interaction and conversation with colleagues, but also through observation of their own lands, although they also use digital tools and social networks. For their evaluations (of success), the majority employ production indicators, followed by economic, environmental, and quality-of-life indicators. Participation in production support and conservation programs is diverse, encompassing governmental and private initiatives, with varying perceptions of their value and benefits. Among the reasons for participating in conservation programs are production improvements, environmental protection, and sustainable development.

The report includes tables and figures to facilitate the reader's understanding of the participation, evaluation, and motivations of ranchers. It provides valuable information about the human dimensions of grassland conservation in the Chihuahuan Desert and its relationship to ranching in Mexico.

Acknowledgments

The authors wish to thank all the ranchers who devoted their time to completing the survey, and with special gratitude to the Chihuahua State Ranchers' Association, which facilitated the administration of the survey to its members.

1. Introduction

The Chihuahuan Desert grasslands are complex ecosystems that have been treated as rangeland for livestock populations in the region. While livestock and ranch owners in the region should be considered partners in restoring healthy and sustainable ecosystems, more needs to be known about their interests and experiences in relation to federal, state, local, and private support programs. To this end, as part of its [Grasslands Conservation and Migratory Birds](#) project, the Commission for Environmental Cooperation (CEC) commissioned a survey of ranchers in the Mexican portion of the central North American grasslands region as a complement to the information obtained from [a similar survey administered to US ranchers, landowners, and producers](#). A team developed and administered the survey, the responses obtained were analyzed, and the results are presented in this report. This study gives insight into the perspectives and living environments of ranchers in northern Mexico, yielding more in-depth information about the human dimensions of grassland conservation and management in this region.

1.1. Overall goal

The overall goal was to learn more, through an online or in-person survey, about the experiences and perspectives of ranchers and rangeland owners in the Chihuahuan Desert, concerning the development and conservation programs.

1.2. Specific objectives

- Design a wide-distribution survey about the experiences of ranchers and rangeland owners, with technical/financial support and grasslands conservation programs.
- Distribute and administer the survey through digital media and also, as applicable, in person using a printed questionnaire.
- Analyze the responses obtained and to derive suggestions and recommendations from the survey results.

2. Methods

A descriptive exploratory study was conducted to ascertain the opinion and experiences of local ranchers and landowners in relation to rangeland production and conservation support programs. The questionnaire consisted of 18 questions, some of them open-ended, some multiple-choice, and some to be answered using a rating scale (see Appendix A). It was developed on KoboToolbox (Pam and Vinck, 2005) to facilitate distribution over digital media and recording of participation. KoboToolbox was preferred over other digital survey application platforms such as Survey Monkey and Google Forms because of its clean and simple design, its accessibility even where Internet access is limited, the user assistance that it offers, its ability to accommodate different types of questions, as well as the tracking tools, the robust data storage, and the preliminary data analysis that it supports. It should be noted that there were some issues of compatibility between the platform and the mobile devices used by some participants, and four respondents were unable to access the platform at all.

They were offered the choice of having the form sent to them as a PDF document but unfortunately, they did not respond.

The questionnaire was administered between September and October 2022 using non-probability sampling. The sample was obtained through a combination of convenience and snowball sampling, as befitted the exploratory nature of the study. The majority of the participants received the survey link through an invitation sent via WhatsApp and Facebook to rancher groups, who in turn took charge of distributing it among their contacts. Additionally, a request was received from staff of the National Protected Natural Areas Commission (*Comisión Nacional de Áreas Naturales Protegidas—Conanp*) to produce a hard copy of the survey for in-person use. Data for the five respondents who used this latter method was subsequently entered on the Kobo platform.

The distribution of the survey was supported by graphic materials consisting of a digital invitation containing a link to the survey, sent by WhatsApp and Facebook (see Figure 1), and a PDF pamphlet attached to the cover page of the survey on the Kobo platform, with 15 different resources offering more information about ongoing North American grassland conservation efforts <<https://bit.ly/3L3sRzF>>.

For the multiple-choice questions, the analysis was descriptive, based on the frequency of each response. For the open-ended questions, a qualitative content analysis was performed, with responses coded and grouped into categories using the ATLAS.ti application, an AI-based data management and analysis package.

Figure 1. Digital invitation distributed over WhatsApp and Facebook groups

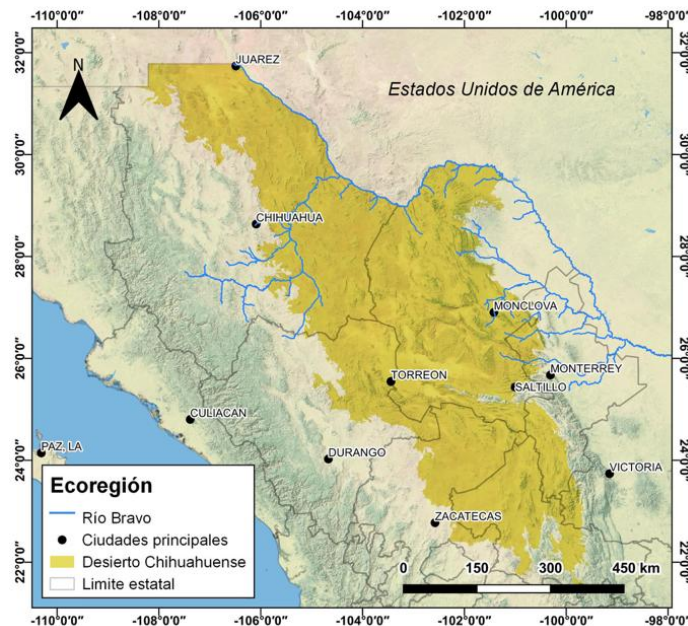


Translation: WE WANT YOUR OPINIONS! Use your phone or computer to answer the Ranchers' Survey. We want to know what you think about pasture lands and your livelihood. Take this 15-minute survey to tell us about your needs and experiences as a producer. If you have trouble filling out the survey, please contact us.

2.1. Study area

The study area was defined as the Chihuahuan Desert region of Mexico. Ranchers in the states of Chihuahua, Durango, Coahuila, Nuevo León, San Luis Potosí, and Zacatecas were invited to participate (see Figure 2).

Figure 2. Area of interest: distribution of localities in the Chihuahuan Desert



Source: Map produced from Conabio data.

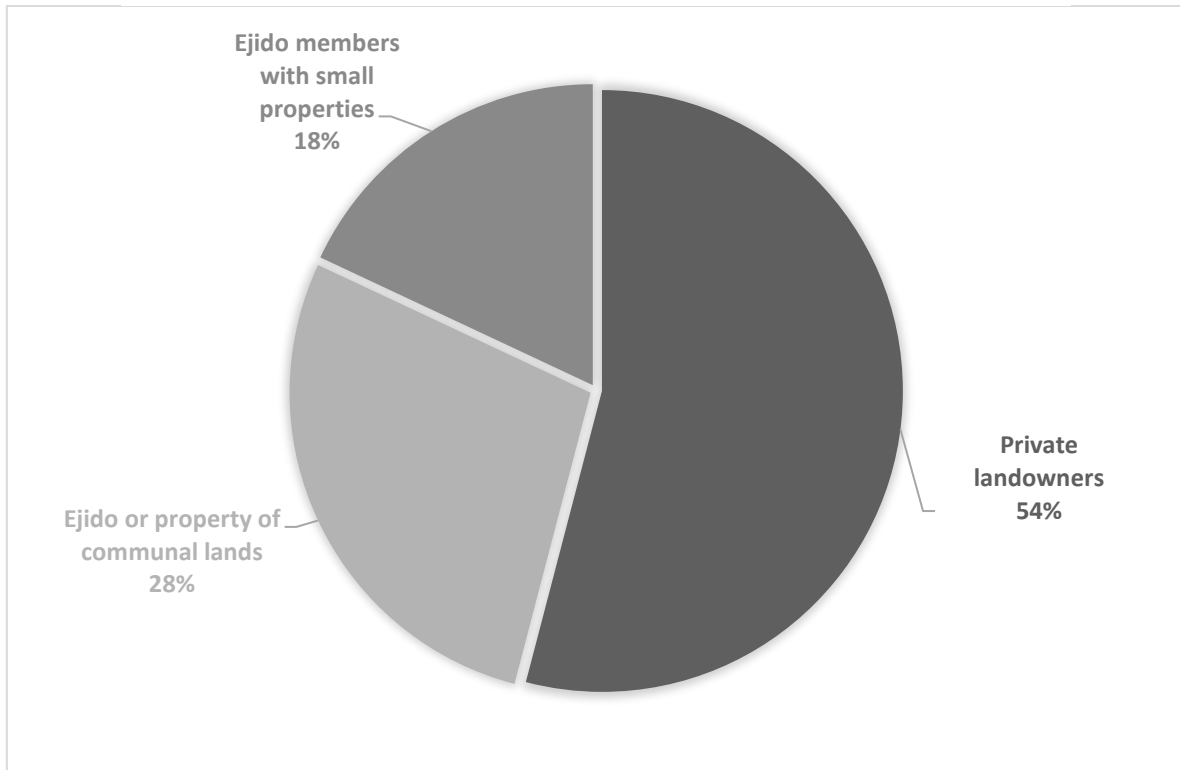
Translation: Ecoregion. Rio Grande. Major City. Chihuahuan Desert. State line.

3. Results

The survey ran from 13 September to 25 October 2022. It received a total of 212 clicks on the link to the KoboToolbox platform. Some of the responses were incomplete, resulting in a total of 172 complete responses received, for an average of four responses per day. This total includes hard-copy surveys completed, for which the data was subsequently entered on the platform. Incomplete responses were excluded from the analysis and results presented in this report.

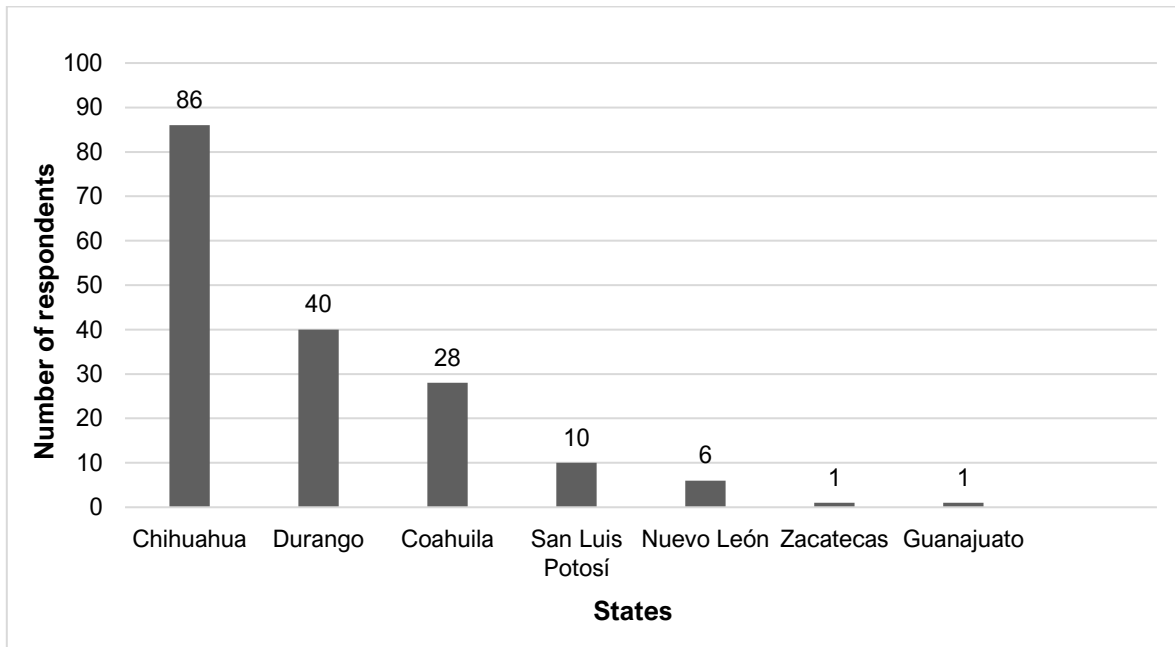
3.1. Types and locations of participating ranchers

Figure 3 gives the percentage of participating ranchers, broken down by property type. Of the total, 54% were private landowners, 28% were occupants of communal lands, and 18% were ejido members with small holdings.

Figure 3. Participating ranchers by property type

The largest proportion of respondents (50%) were in the state of Chihuahua, with 25% in the state of Durango and 15% in the state of Coahuila. These three states were thus home to 90% of the survey respondents (see Figure 4). The states of San Luis Potosí and Nuevo León accounted for most of the remaining respondents (<10), with one respondent each for the states of Zacatecas and Guanajuato. These data show that private ranchers in the states of Chihuahua, Durango, and Coahuila were the best-represented sectors in the study. This may be because of their higher participation in collaborative networks, which gave them better access to information and made for more effective distribution of the invitation to participate. Notably, a major effort by the Chihuahua State Ranchers' Association in the final weeks of the survey presumably helped to increase the participation of ranchers in that state.

Figure 4. Location of properties



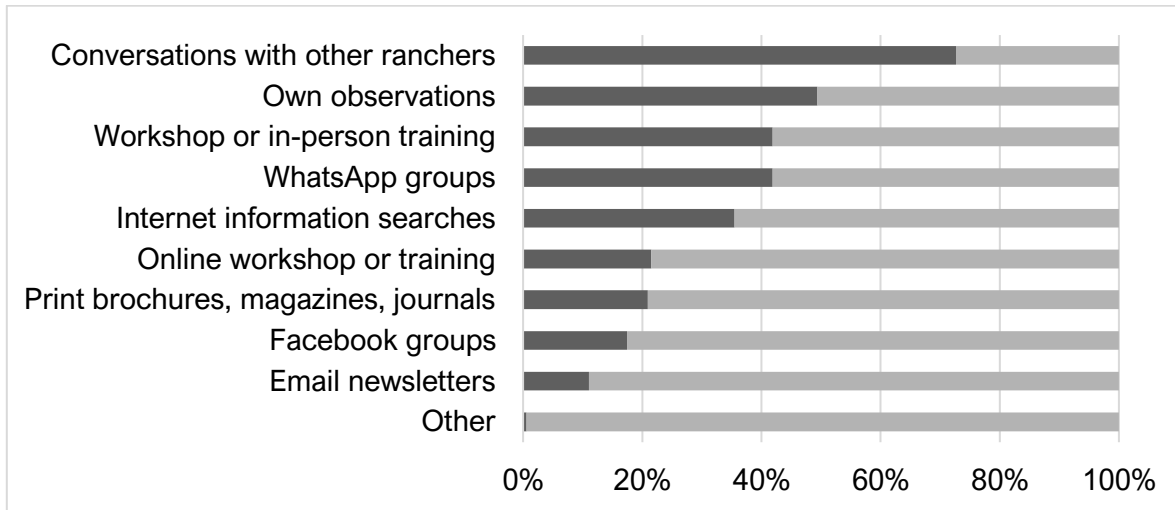
3.2. How the respondents obtain information about grassland management

A significant result of the survey concerns how the respondents obtain information about grasslands conservation and ranching practices. Given a list of options, they were asked to select the sources they would use most frequently to obtain this kind of information.

Although information and communication technologies predominate in many spheres of social life, the survey shows that personal contact remains important as a learning strategy for ranchers. Of the respondents, 72% obtain information from direct interactions and conversations with colleagues, while 40 to 50% use exchanges of observations, e.g., through workshops and WhatsApp groups, to help them manage their rangeland and livestock. Less than 35% prefer to obtain information through the Internet, pamphlets, magazines, journals, Facebook, or email (see Figure 5).

These results indicate the importance of fostering exchanges of experiences among ranchers, as well as horizontal learning models in which they can learn from one another, exchange opinions, and participate in building their own solutions to various challenges.

Figure 5. Information sources about grasslands and their management used by the respondents



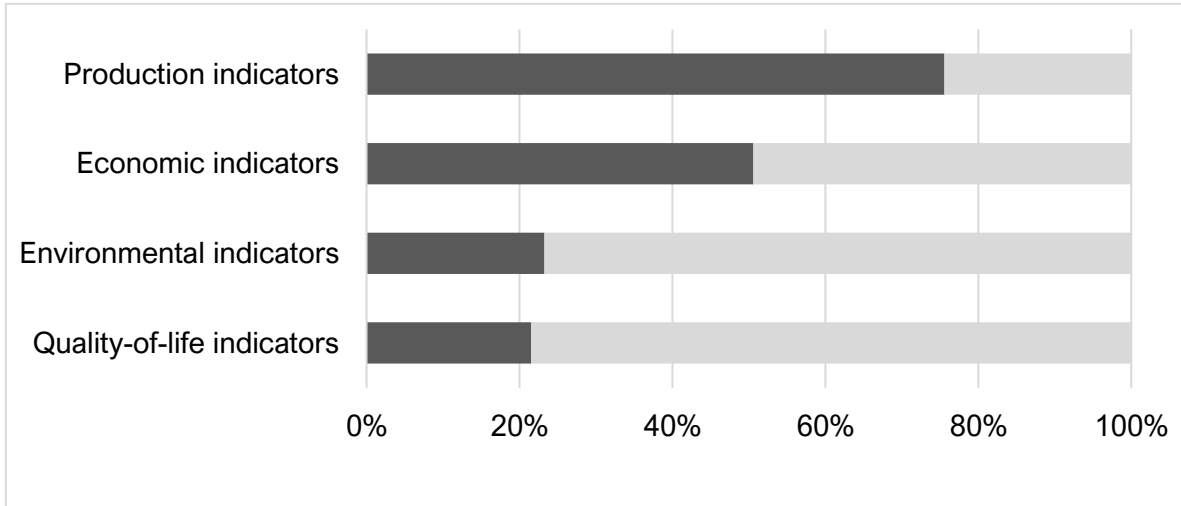
3.3. Indicators of ranching success

A key aspect of learning about respondents' perspectives had to do with the ways they evaluate their success. The indicators that they use for this can help us understand the emphasis on and focus of their ranching operations, as well as possible trends or fora for proposing comprehensive or alternative methods of measurement.

The respondents were asked to select the types of indicators that they use most frequently. The categories offered included economic indicators (such as profit, revenues/expenses, or balance sheet); production indicators (e.g., percentages of breeding, calving, and weaning); environmental indicators (e.g., biodiversity inventories, carbon capture, soil and grassland improvement); and quality-of-life indicators (e.g., social security, health services, improvement or acquisition of basic services), as well as combinations of indicators, if any.

Among the survey respondents, 72.6% indicated that they use production indicators, while 50% said that they used economic indicators. The least-mentioned indicator categories were environmental and quality-of-life indicators, which were mentioned by only about 20% of respondents (see Figure 6).

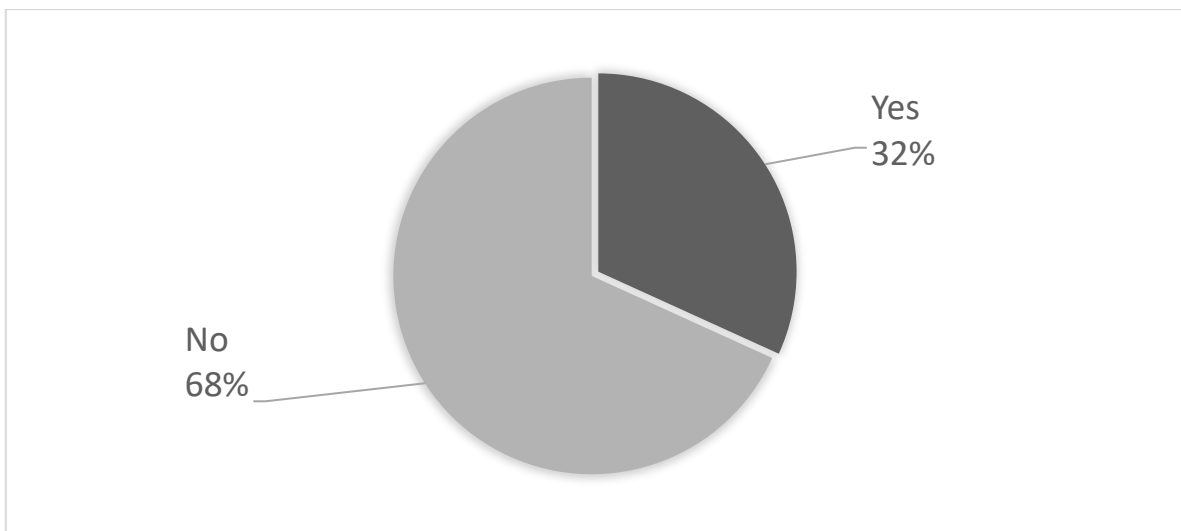
Figure 6. Frequency of indicators used by ranchers



3.4. Production support programs

This section presents the results of the survey questions covering ranchers' experiences with production support programs. Of the 172 respondents, 118 (68%) stated that their properties are not enrolled in such a program, while 54 (32%) said that they are (see Figure 7). Of the first group, 56 (47%) stated an interest in receiving more information on this subject, indicating a potential opportunity to reach additional ranchers. Of the second group, 26 (48%) are private landowners, while the remainder are ejido residents with or without additional small private landholdings.

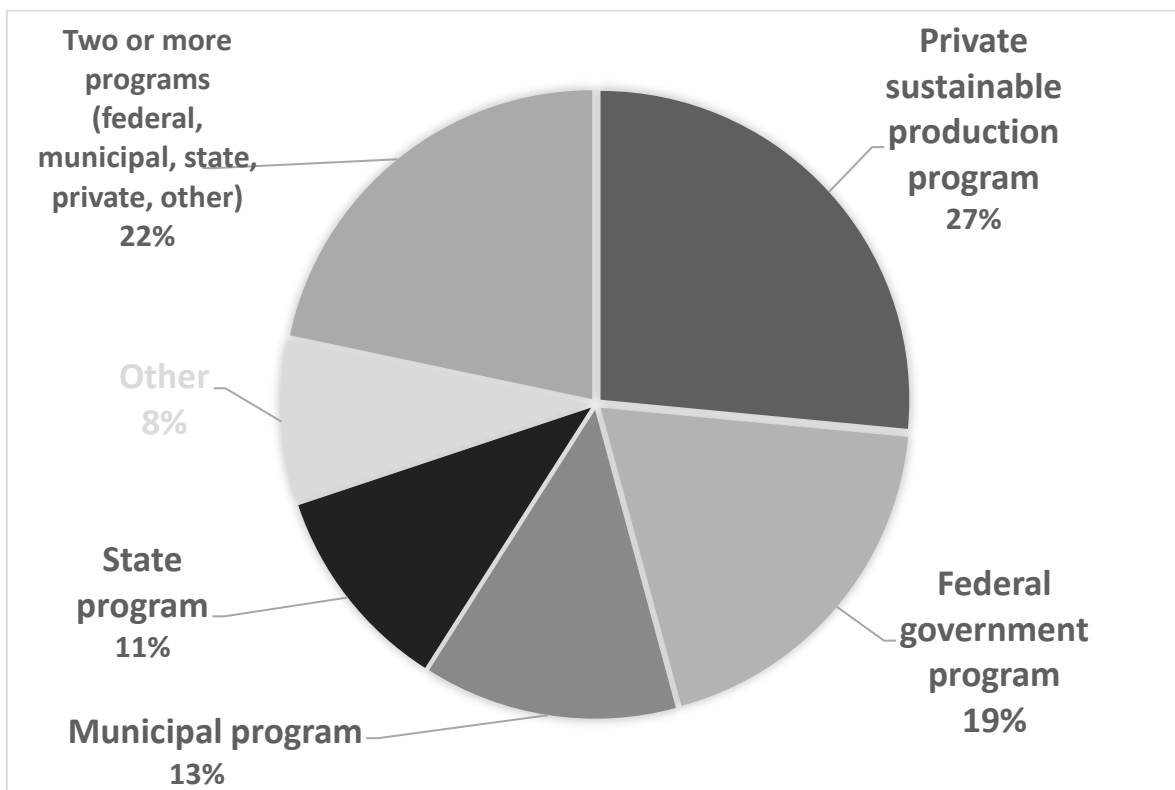
Figure 7. Respondents enrolled in production support programs



The survey data show that government programs are, to date, the most accessible option for ranchers. Of the 54 who reported participating in a production support program, 19% stated that they participate in federal programs, 13% in state programs, and 11% in municipal programs, for a total of 43%. An additional 22% stated that they are involved in both governmental and private support programs. These findings corroborate the importance to ranchers of government-sponsored support programs, particularly those offered at the federal level.

These data also show the significant presence in this region, as elsewhere in the country, of nongovernmental organizations working on ranching issues.

Figure 7. Percentage of respondents participating in a production support program



3.5. Opinions and suggestions about production support programs

This section discusses the respondents' evaluation of production support programs. It goes on to consider their answers to the open-ended question about the weaknesses or problems of programs in which they participate.

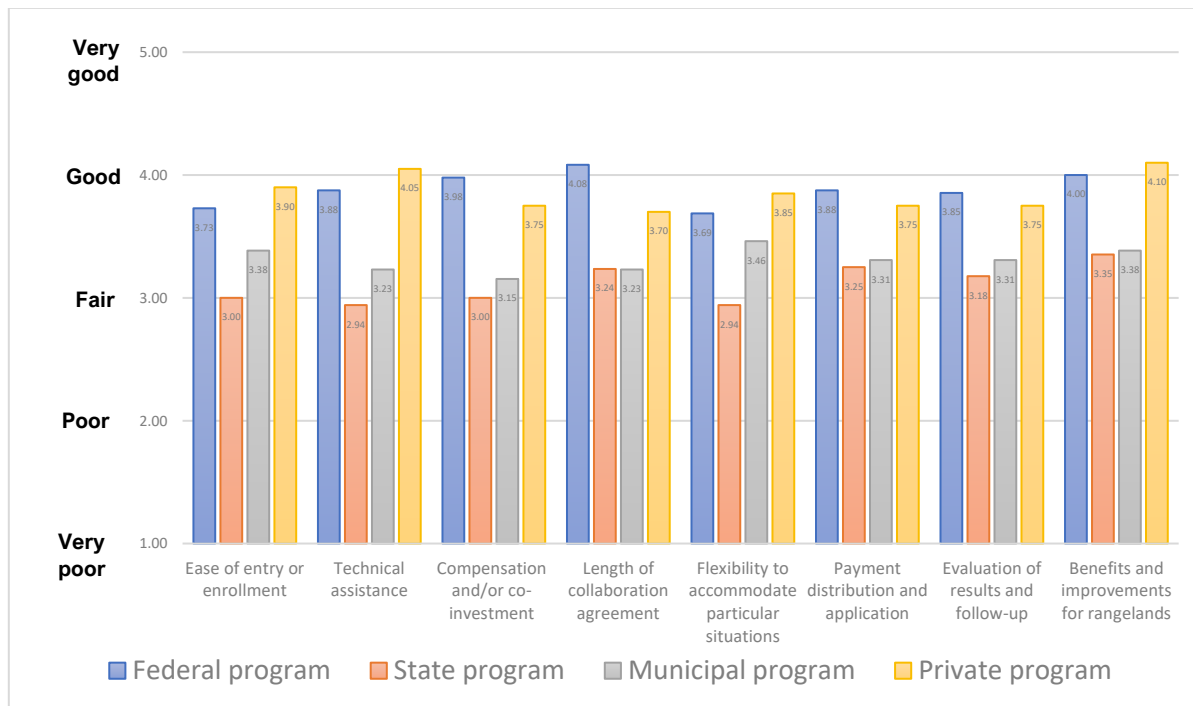
On the first point, the following evaluation criteria were offered:

- Ease of entry or enrollment.
- Technical assistance.
- Compensation and co-investment
- Length of collaboration agreement.
- Flexibility to accommodate particular situations.
- Payment distribution and application.
- Evaluation of results and follow-up.
- Benefits and improvements for properties (grasslands)

Respondents were asked to rate each criterion on a scale from 1 to 5, where these scores indicate “very poor,” “poor,” “fair,” “good,” and “very good,” respectively. The results show that state programs scored the lowest overall, while “flexibility to accommodate particular situations” was the lowest-rated criterion, between poor and fair. Municipal and federal programs fared better, scoring fair to good on all criteria.

Private programs averaged good overall, earning the highest ratings for “benefits and improvements for properties”; these programs fared worse than federal programs, however, on four of the eight criteria. All criteria scored fair to good overall. Figure 9 presents the results for each criterion and program.

Figure 8. Evaluation of production support programs



Concerning the problematic aspects of support programs, the respondents participating in such programs were asked to answer the question: “What weaknesses or problems have you experienced with the production support programs in which your rangeland is enrolled?”

The 21 responses obtained were subjected to qualitative analysis, being grouped into 13 categories. Most frequently mentioned were lack of follow-up and assistance (16.7%), lack of resources (16.7%), and bureaucracy (12.5%). Sample responses for each category are given in Table 1.

Table 1. Most frequent responses concerning weaknesses and problems with production support programs

Category	Example	Frequency
Lack of follow-up and assistance	<i>Improvement projects are sometimes implemented but, in my experience, there is no follow-up.</i>	16.7%
Lack of resources	<i>More resources are needed.</i>	16.7%
Bureaucracy	<i>Too many requirements or unnecessary paperwork.</i>	12.5%

Other, less frequently mentioned categories were inadequate information (8.33%), long wait times (8.33%), and lack of technicians and extension specialists in the field (8.33%).

The respondents were asked for suggestions on how to improve production support programs. Table 2 presents some of the more common responses, broken down by category of response. The respondents emphasized the need for better and more frequent visits and assistance by technicians from the organizations providing support and assistance to field projects. They also suggested that programs be adaptable to the needs of different contexts and, in particular, that they accommodate specific local conditions. In other words, programs should be made flexible and studies should be conducted in order to better understand the specific contexts in which support programs are applied. A third suggestion from the respondents was that there be more rancher participation.

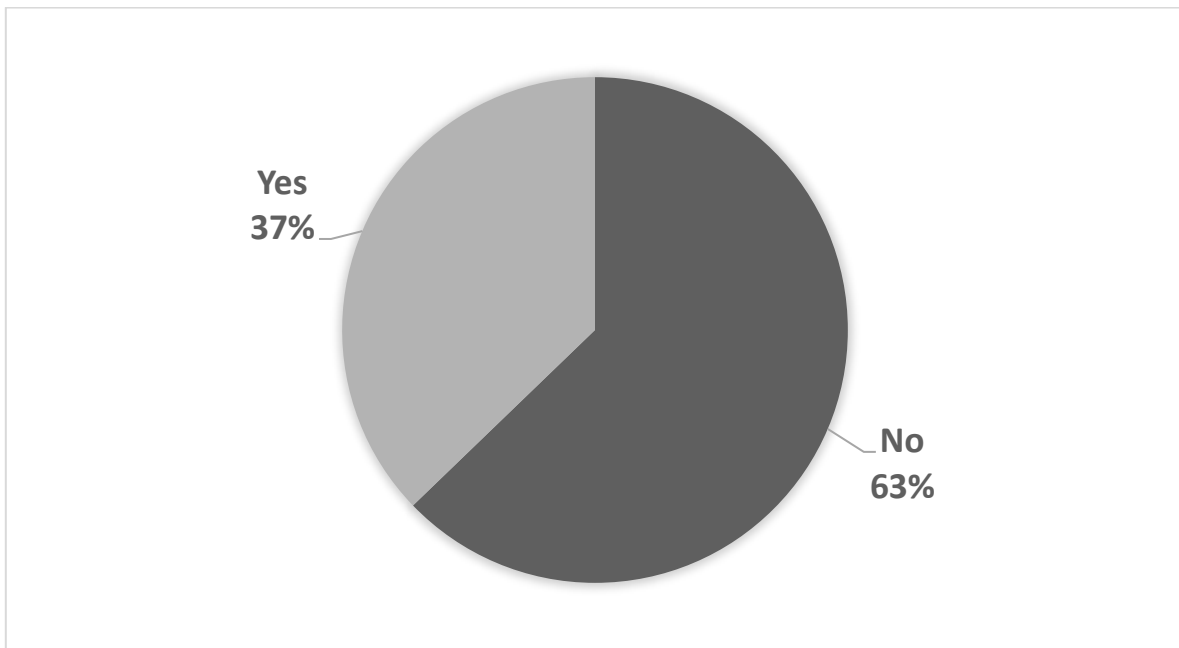
Table 2. Most frequent responses concerning suggestions about production support programs

Category	Example	Frequency
Assistance and follow-up for projects and programs	<i>There should be more assistance and follow-up for projects.</i>	21.2%
Flexibility of support programs	<i>Studies should be conducted in each rural area, since each area has its particularities and may therefore require different support measures.</i>	18.2%
Rancher contributions and participation	<i>Greater commitment and dedication on the part of ranchers participating in programs.</i>	12.5%

3.6. Conservation support programs

Conservation programs are important for the sustainable development of grasslands. It is therefore relevant to ascertain the degree to which ranchers participate in such programs. Of the respondents, 69% said that their properties are not enrolled in an environmental protection or grassland conservation program, while 31% said that their properties are enrolled in one or more such programs (see Figure 10).

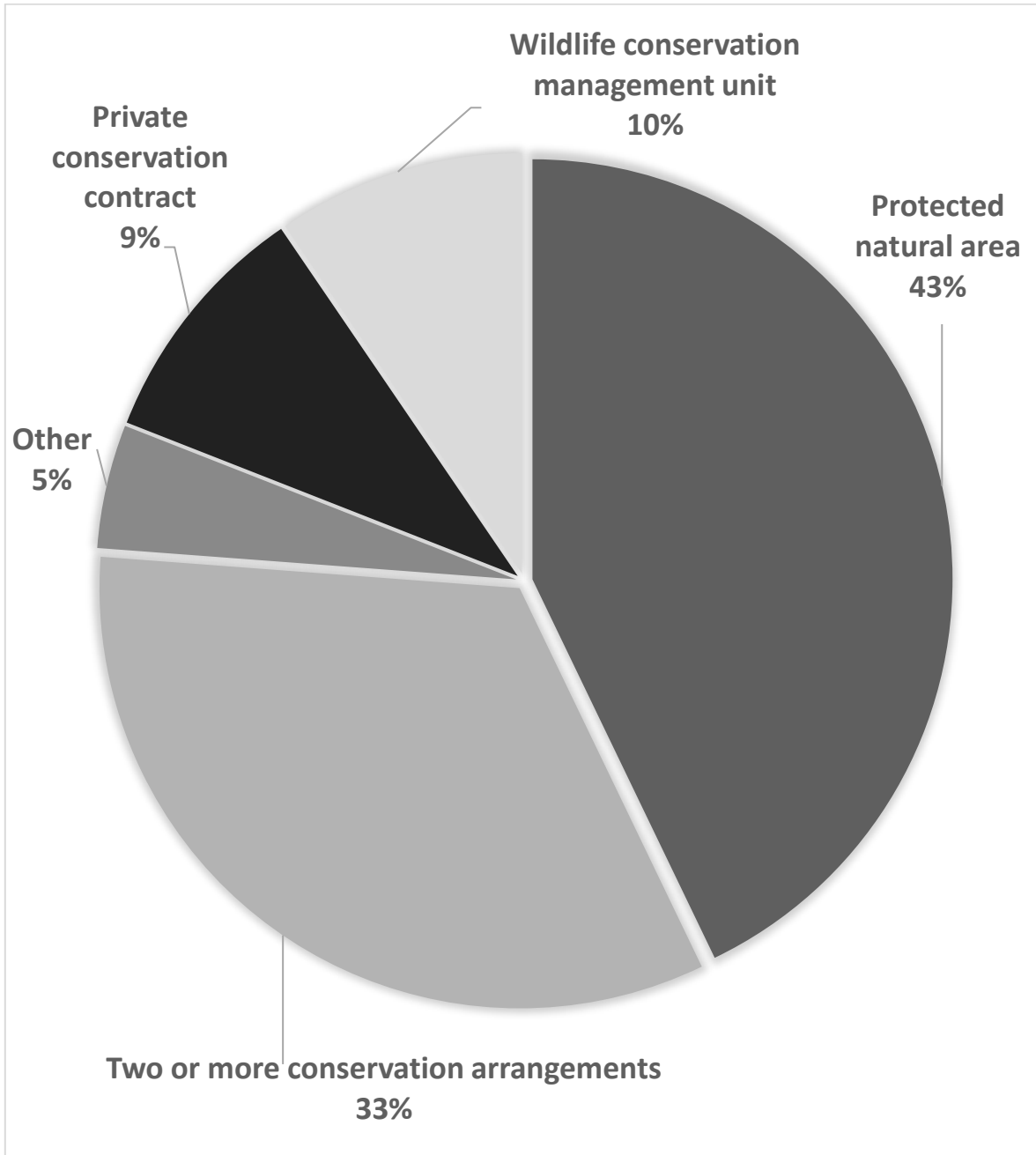
Figure 9. Percentage of properties enrolled in a conservation program



The environmental protection or grassland conservation programs evaluated were grouped into six categories: protected natural areas (ANP), which may be federal, state, or municipal; wildlife conservation management units (UMA); payment for environmental services (PSA); voluntarily designated conservation areas (ADVC); community zoning (OTC), and private conservation contracts. Among properties enrolled in a conservation program, the ANP was the most frequently mentioned type (43%), while 10% of properties are participating in a UMA and 9% have signed private conservation contracts (see Figure 11). Interestingly, of the total respondents with properties enrolled in environmental protection or grassland conservation programs, 33% participated in at least two such programs.

Of the respondents who stated that their properties are not involved in a conservation program, 68% stated an interest in enrolling in one, while 32% stated an interest in knowing or learning more about such programs before making a decision.

Figure 10. Types of conservation programs in which respondents participate



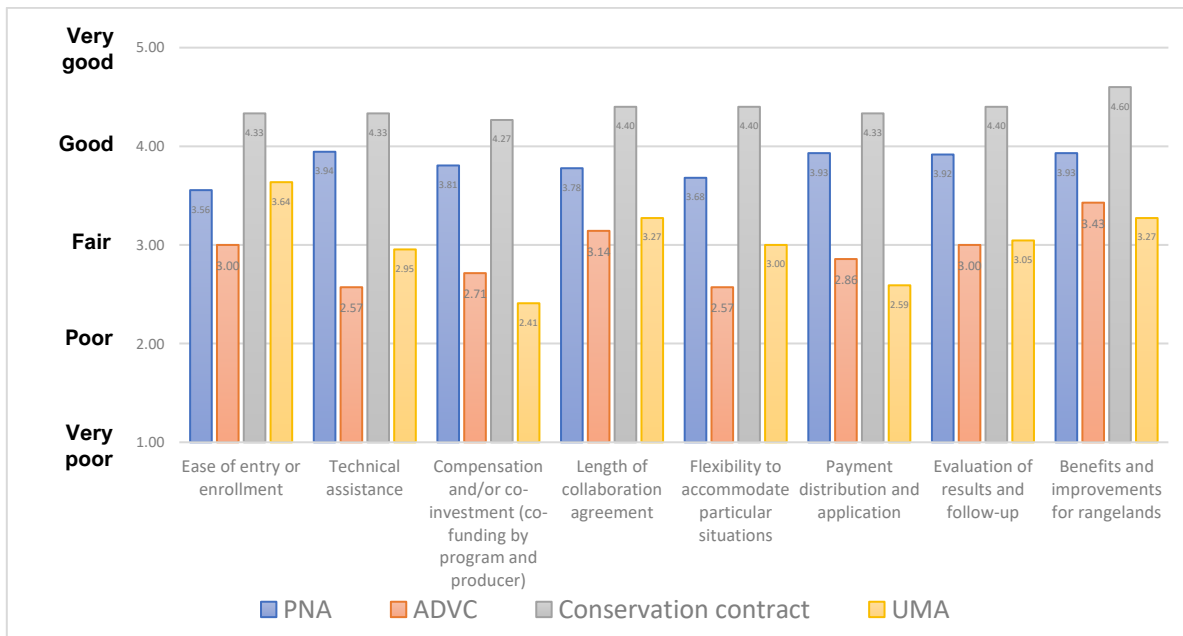
3.7. Evaluation of conservation support programs

The respondents evaluated conservation support programs with respect to eight criteria:

- Ease of entry and access to information on programs and projects.
- Technical assistance.
- Compensation and co-investment.
- Length of collaboration agreement.
- Flexibility to accommodate particular situations.
- Payment distribution and application.
- Evaluation of results and follow-up.
- Benefits and improvements for properties (grasslands).

As they did for production support programs, respondents were asked to rate these criteria on a scale of 1 to 5, where 1 denotes “very poor”; 2, “poor”; 3, “fair”; 4, “good,” and 5, “very good.”. The results are presented in Figure 12, which gives the averages for each criterion in each program evaluated.

Figure 11. Evaluation of conservation support programs

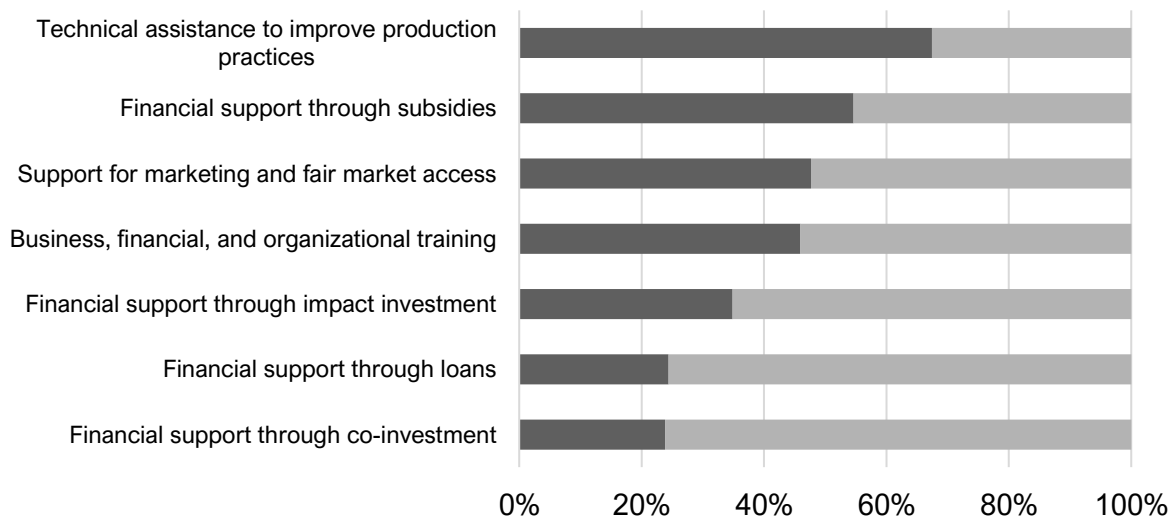


Private conservation contracts scored highest, from good to very good, mainly for the “benefits and improvements for properties” criterion, while ADVCs and UMAs scored lowest, from poor to fair, mainly for the “technical assistance” and “compensation and co-investment” criteria. As may be observed, “benefits and improvements” was the highest-scoring criterion for all programs.

3.8. Desirable characteristics of conservation support programs

One of the survey questions referred to the three main characteristics that ranchers expect from environmental protection and grassland conservation support programs. The highest-scoring characteristics were “technical assistance to improve production practices” (named by 67% of respondents), “financial support through subsidies” (54%), and “support for marketing and fair market access (47%) (see Figure 13).

Figure 12. Desirable characteristics of conservation support programs



3.9. Reasons for participating in environmental protection or grassland conservation programs

Respondent ranchers stated the main reasons why they would participate in protection programs by answering the question: “What motivated you to participate in the environmental protection or grassland conservation program in which your property is enrolled?” The qualitative analysis of the responses found that 29.5% fell under the heading of “production improvements,” referring to the importance of conservation in maintaining or increasing ranching activities; 21.3% fell under the heading of “environmental improvements,” including remarks about environmental conservation and protection, and 13.0% fell under the heading of “sustainable development;” referring to the need to conceive of ranching as a long-term activity for the generations to come, one that is interconnected with social, economic, and environmental improvement.

Table 3. Most frequent responses about motivations for participating in environmental protection or grassland conservation programs

Category	Example	Frequency
Production improvements	<i>Being able to improve properties so as to keep them productive in perpetuity.</i>	29.5%
Environmental improvements	<i>Improving our grasslands and the environment.</i>	21.3%
Sustainable development	<i>Improving grasslands to ensure the continued livelihoods of future generations.</i>	13.0%

3.10. Opinions about weaknesses and problems with grassland protection or conservation programs

Similarly, the respondents were asked to discuss their negative experiences with environmental protection or grassland conservation programs, or any weaknesses thereof. Of the responses, 22.58% fell under the heading “lack of follow-up and assistance for projects,” 16.13% under “lack of resources for projects,” and 12.90% under “lack of planning.”

Table 4. Most frequent categories of responses about weaknesses and problems in grassland protection or conservation programs

Category	Example	Frequency
Lack of follow-up and assistance for projects	<i>There is no follow-up; there have been many programs and they disappear suddenly.</i>	22.58%
Lack of resources for projects	<i>No budgets allocated by the state and federal governments.</i>	16.13%
Lack of planning	<i>Programs that are not well structured.</i>	12.90%

Finally, the respondents were asked to convey a message to politicians and civil society about ranchers and the realities of their community. The question they were asked was: “What message would you like to convey to politicians, government authorities, civil society organizations, and the general public about the community of ranchers living and working in the Chihuahuan Desert grasslands?” Typical responses are given in Table 5.

Table 5. Most frequent responses that ranchers would convey about their community and their way of life in the Chihuahuan Desert grasslands

Category	Example	Frequency
Support for rural areas	<i>Chihuahuan Desert ranchers should receive more support.</i>	26.00%
Awareness of rural areas	<i>Rural areas must not be forgotten because we recharge the water table and provide food for cities.</i>	17.60%
Affirmation and recognition	<i>Ranching is an activity essential to maintaining food independence.</i>	15.15%

4. Conclusions

The purpose of surveying the Chihuahuan Desert ranchers was to learn about their experiences with production and conservation support programs. The results can help us understand how these ranchers obtain information and learn about production practices; what types of indicators they most frequently employ to gauge the success of their operations; and how they evaluate and participate in such programs.

While a considerable level of participation by Chihuahuan Desert ranchers was achieved, the participation was heavily concentrated in the state of Chihuahua. Thus, the results obtained may not be fully representative.

The first important finding was that when they need to share practices and learn more about grassland/rangeland management, ranchers most frequently use in-person meetings and conversations. This suggests that there is a need to create opportunities for such interaction, and the potential for exchange and learning networks.

Nearly 75% of the respondents use production indicators to evaluate their productivity and the success of their ranching operation. Other indicators are also used, although less frequently, to evaluate environmental success and the quality of life of ranching families. This indicates an interest in incorporating other types of indicators beyond the traditional ones.

More than half the people surveyed indicated that they are not participating in production support programs, although they stated an interest in receiving information on this subject. Private landholdings are the property most frequently enrolled in such programs, with government-sponsored programs being the most commonly used. Yet, government programs received poorer evaluations overall than private programs.

The weaknesses and problems most often mentioned by respondents as hampering production support programs were the lack of follow-up and assistance, the lack of resources for the programs themselves, and the bureaucracy that must be navigated to enroll in these programs. The respondents also mentioned a need for greater program flexibility and for accommodation of particular local conditions.

More than half the respondents indicated that they are not participating in grassland conservation programs. However, the majority also did express an interest in receiving information and learning about this type of program.

Ranchers with properties involved in conservation programs mentioned protected natural areas (ANP) as the most frequently used arrangement. Private conservation contracts were the best-evaluated arrangement, with scores ranging from “good” to “very good,” while the lowest score corresponded to UMAs (wildlife conservation management units (*unidades de manejo para la conservación de la vida silvestre*)).

The three essential characteristics of conservation support programs, according to the respondents, are “technical assistance for improved production practices,” “financial support through subsidies,” and “support for marketing and access to fair markets.” Nearly one-third of the people surveyed stated that they would participate in grassland conservation support programs that lead to improved production. On the other hand, people already participating in such programs indicated a lack of follow-up and assistance for projects as their most frequent weaknesses.

The survey results show that ranchers and rangeland owners in the Chihuahuan Desert continue using traditional media and in-person meetings for receiving information and learning about grassland management. This should be kept in mind, in order that information is distributed through such channels. Needless to say, participation in grassland production and conservation support programs increases as a function of one’s having learned about such programs directly (mainly through personal contacts).

Furthermore, there was a strong perception among respondents that government has abandoned rural areas and that society undervalues the corresponding economic activities, including ranching. This may explain why respondents involved in both governmental and private programs put an emphasis on the need for technical assistance and follow-up for their projects. Making a more serious commitment to offering such assistance to rangeland owners may well be one of the most important things that such programs can and should do. Such technical assistance can strengthen channels of communication among the region’s ranchers while also promoting aspects of sustainable management that are of particular interest to the ranchers, particularly as regards the private sector.

The responses also indicate the need to adapt environmental protection and grassland conservation programs by taking local conditions into consideration, by making these programs more flexible, and by conducting studies to understand the realities of ranchers and their lands. In addition, the respondents called for more investment in these programs, for subsidies, and for marketing support. Given the comments received in this study about programs offered by private organizations, it is recommended that these programs be identified and their best practices documented, with a view to learning about the gamut of ranching practices used throughout the North American grassland region.

Appendix A

Survey of Chihuahuan Desert Grassland Ranchers [Original language: Spanish]

The Commission for Environmental Cooperation (CEC) seeks to learn more about management and conservation measures for North American grasslands, and to support measures for the conservation of this valuable ecosystem. We invite you to complete the following survey, so that we can gather the opinions of local ranchers and landowners in the Chihuahuan Desert Grassland region of Mexico.

With your support, we can better identify your needs and those of your rangelands!

1. Concerning your ranch, select the option that best represents you:

- a. I am a private landowner.
- b. I am an ejido resident or a communal landowner.
- c. I am an ejido resident and I also have a small private property.

2. In which state(s) is your rangeland located? (Check all that apply.)

- a. Nuevo León
- b. Coahuila
- c. Zacatecas
- d. Chihuahua
- e. Durango
- f. Querétaro
- g. San Luis Potosí
- h. Guanajuato

3. What activities do you use most frequently to obtain information and learn about grassland management and your ranching operations? (select up to three answers)

- a. In-person workshop or training session.
- b. Online workshop or training session.
- c. Printed brochures and magazines or journals.
- d. Email newsletter.
- e. WhatsApp groups.
- f. Facebook groups.
- g. Your own observations.
- h. Conversations with other ranchers.
- i. Internet searches.
- j. Other: _____

4. Which of the following indicators do you use most frequently to evaluate the success of your ranching operations?

- a) [] Environmental indicators (e.g., biodiversity inventories, carbon capture, soil and grassland improvements).
- b) [] Economic indicators (e.g., profit, revenues-expenses, balance sheet).
- c) [] Production indicators (e.g., percentages of breeding, calving, and weaning, mortality).
- d) [] Quality-of-life indicators (e.g., benefits for your family and workers, improvement or acquisition of basic services such as light, electricity, drinking water).

PRODUCTION SUPPORT PROGRAMS

5. Is your rangeland enrolled or participating in government-sponsored or private production support programs?

If you answered yes, go to question 7.

If you answered no, answer question 6 and then skip to question 10.

- a. [] Yes
- b. [] No

6. Are you interested in receiving information about this type of program?

- a. [] Yes
- b. [] No

7. Among the following options (a-d), find the production support programs in which your property is enrolled and rate each of the aspects listed (1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = very good)

a) Federal government program (e.g., Sader, Conaza, Bienestar)

- [] Ease of entry or enrollment
- [] Technical assistance
- [] Compensation and/or co-investment
- [] Length of collaboration agreement
- [] Flexibility of programs to accommodate particular situations
- [] Payment distribution and/or application
- [] Evaluation of results and follow-up
- [] Benefits and improvements to your rangelands

b) State program (e.g., a program of the state agri-food or agricultural development department).

- [] Ease of entry or enrollment
- [] Technical assistance
- [] Compensation and/or co-investment

- Length of collaboration agreement
- Flexibility of programs to accommodate particular situations
- Payment distribution and/or application
- Evaluation of results and follow-up
- Benefits and improvements to your rangelands

c) *Municipal program (e.g., municipal rural development).*

- Ease of entry or enrollment
- Technical assistance
- Compensation and/or co-investment
- Length of collaboration agreement
- Flexibility of programs to accommodate particular situations
- Payment distribution and/or application
- Evaluation of results and follow-up
- Benefits and improvements to your rangelands

d) *Private sustainable production program (e.g., grasslands program of Pronatura Noreste, A.C.; Bird Conservancy of the Rockies Sustainable Grazing Network)*

- Ease of entry or enrollment
- Technical assistance
- Compensation and/or co-investment
- Length of collaboration agreement
- Flexibility of programs to accommodate particular situations
- Payment distribution and/or application
- Evaluation of results and follow-up
- Benefits and improvements to your rangelands

8. What weaknesses or problems have you experienced with the production support programs in which your rangeland is enrolled? Tell us about your experience.

9. What would you recommend improving the operation and outcomes of the production support programs in which your rangeland is enrolled?

GRASSLAND CONSERVATION PROGRAMS

10. Is your rangeland covered by an environmental protection or conservation arrangement? (e.g., state, federal, or municipal protected natural area, voluntarily designated area, wildlife management unit, conservation contract.)

If you answered “yes,” go to question 12.

If you answered “no,” answer question 11 and then skip to question 16.

a. Yes.

b. No.

11. Are you interested in including your rangeland in a protection and conservation arrangement?

a. Yes.

b. No.

c. I need more information.

12. Among the following options (a-f), find the grasslands environmental protection or conservation programs covering your ranching properties and rate each of the aspects listed.

a. *Protected natural area (ANP, federal, state or municipal)*

Rate each of the following aspects: 1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = very good.

Ease of entry and sharing of program and project information

Technical assistance

Compensation and/or co-investment

Length of collaboration agreement

Flexibility of programs to accommodate particular situations

Payment distribution and/or application

Evaluation of results and follow-up

Benefits and improvements to your rangelands

b. *Voluntarily designated conservation area (ADVC)*

Rate each of the following aspects: 1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = very good.

Ease of entry and sharing of program and project information

Technical assistance

Compensation and/or co-investment

Length of collaboration agreement

Flexibility of programs to accommodate particular situations

Payment distribution and/or application

Evaluation of results and follow-up

Benefits and improvements to your rangelands

c. *Private conservation contract (e.g., Pronatura Noreste, Bird Conservancy of the Rockies)*

Rate each of the following aspects: 1 = very poor, 2 = poor, 3 = fair, 4 = good y 5 = very good.

- [] Ease of entry and sharing of program and project information
- [] Technical assistance
- [] Compensation and/or co-investment
- [] Length of collaboration agreement
- [] Flexibility of programs to accommodate particular situations
- [] Payment distribution and/or application
- [] Evaluation of results and follow-up
- [] Benefits and improvements to your rangelands

d. [] *Wildlife conservation management unit (UMA)*

Rate each of the following aspects: 1 = very poor, 2 = poor, 3 = fair, 4 = good y 5 = very good.

- [] Ease of entry and sharing of program and project information
- [] Technical assistance
- [] Compensation and/or co-investment
- [] Length of collaboration agreement
- [] Flexibility of programs to accommodate particular situations
- [] Payment distribution and/or application
- [] Evaluation of results and follow-up
- [] Benefits and improvements to your rangelands

e. [] *Payment for environmental services (from Conafor)*

Rate each of the following aspects: 1 = very poor, 2 = poor, 3 = fair, 4 = good y 5 = very good.

- [] Ease of entry and sharing of program and project information
- [] Technical assistance
- [] Compensation and/or co-investment
- [] Length of collaboration agreement
- [] Flexibility of programs to accommodate particular situations
- [] Payment distribution and/or application
- [] Evaluation of results and follow-up
- [] Benefits and improvements to your rangelands

f. [] *Community zoning*

Rate each of the following aspects: 1 = very poor, 2 = poor, 3 = fair, 4 = good y 5 = very good.

- Ease of entry and sharing of program and project information
- Technical assistance
- Compensation and/or co-investment
- Length of collaboration agreement
- Flexibility of programs to accommodate particular situations
- Payment distribution and/or application
- Evaluation of results and follow-up
- Benefits and improvements to your rangelands

13. Specify any other environmental protection or conservation arrangement or program in which your land is enrolled.

14. What motivated you to participate in these environmental protection or grassland conservation programs? Tell us about your experience.

15. What weaknesses or problems have you experienced with the support programs in which your property is enrolled? Tell us about your experience.

16. Select the three main characteristics that an environmental protection or grassland conservation program would have to offer in order to be of interest to you:

- Financial support through subsidies.
- Financial support through impact investment.
- Financial support through co-investment.
- Financial support through loans.
- Technical assistance to improve production practices.
- Support for marketing and fair market access.
- Business, financial, and organizational training.

17. What message would you like to convey to politicians, government authorities, civil society organizations, and the general public about the community of ranchers living and working in the Chihuahuan Desert grasslands?

18. We would like to know the opinions of ranchers and rangeland owners such as yourself. If you would like to be involved in grassland conservation and sustainable use efforts, please share your email and telephone number. Your data will be used exclusively for purposes of information.

Email _____

Telephone _____

The grasslands thank you for your support and effort!

Your personal information and data will be kept confidential and will be used only for information and research purposes, in accordance with the privacy policy of Pronatura Noreste, A.C.: <www.pronaturanoreste.org/aviso-de-privacidad>.

References

DOF (2022). “ACUERDO de carácter general de inicio de emergencia por ocurrencia de sequía severa, extrema o excepcional en cuencas para el año 2022.” Mexico City: *Diario Oficial de la Federación*.

Pam, P., and P. Vinck (2005). *KoboToolbox*, online at <www.kobotoolbox.org/kobo/>.