



Adaptative
RESPONSES
TO EXTREME
Drought

RURAL LIVESTOCK FARMERS

Baja California Sur, México

A CASE STUDY

Did you know that between 2020 and 2022, Baja California Sur faced one of the most severe droughts in its history?

This extreme event impacted both local ecosystems and the rural communities that depend on them. This study explores how traditional ranchers coped with this crisis, the limits of their resilience, and the opportunities to ensure their sustainability in a changing climate context.

Why is this study important?

Environmental variability is a constant challenge for populations that depend on natural resources, such as rural ranchers. In Baja California Sur:

- The severe drought of 2020-2022 was the main cause of plant and community affectations.
- This crisis resulted in vegetation loss, food insecurity, income reduction and habitat deterioration.

Despite these challenges, ranchers have shown remarkable resilience.

THIS STUDY AIMS TO:

1. Analyze how drought affected ecosystems and human responses to this phenomenon in three key regions:
 - Loreto / Sierra La Giganta Norte
 - Las Animas / Sierra La Giganta Sur
 - Sierra Cacachilas / Zona del Cabo
2. Evaluate the recovery of ecosystems and ranches after the recent drought and tropical storms.
3. Identify strategies to strengthen the cultural and ecological resilience of the communities that live there.



METHODOLOGY

Between April and May 2024, semi-structured interviews were conducted with 98 rural ranches to analyze their responses to the challenges caused by extreme drought, in the Cabo region (31), Sierra de La Giganta Sur (37) and Sierra de La Giganta Norte (30)

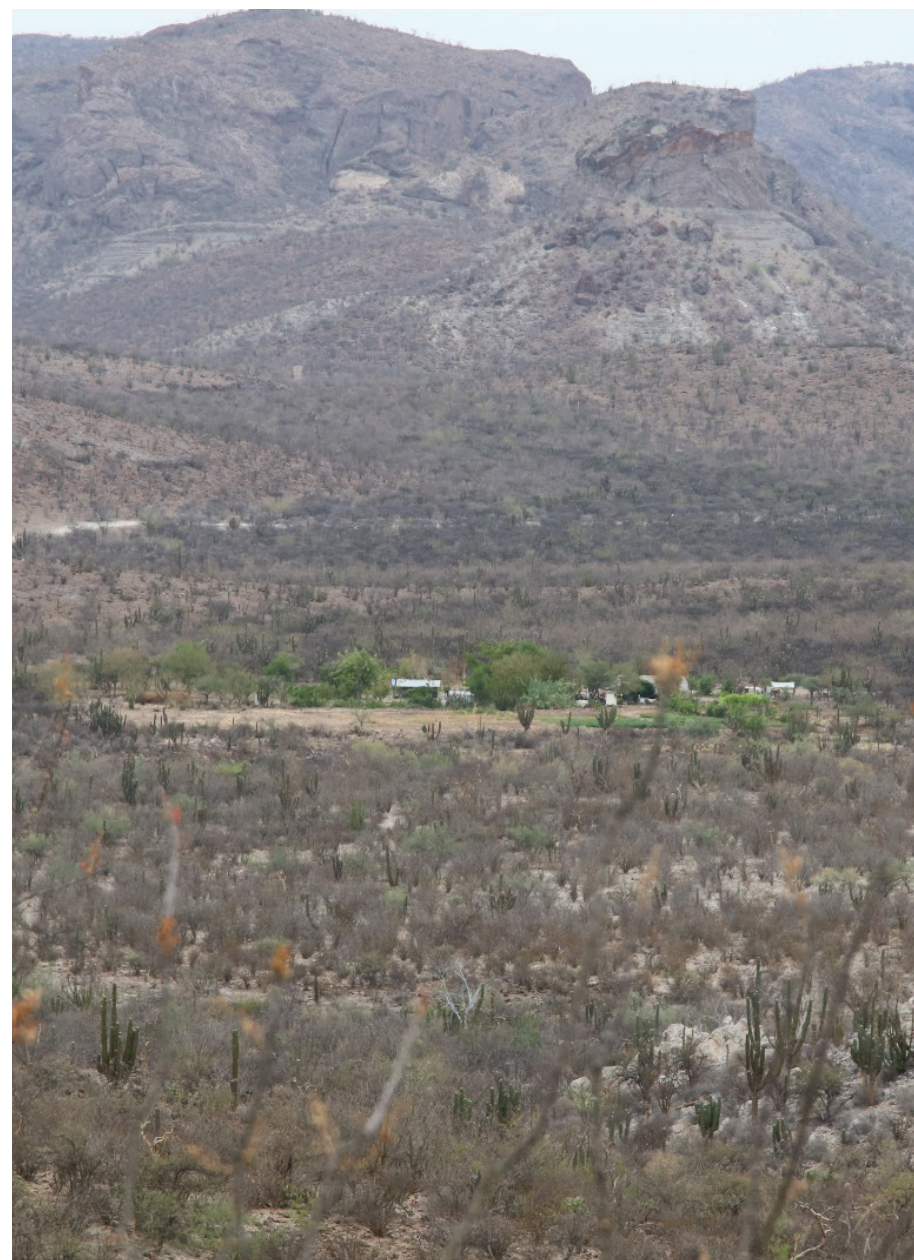
Main findings:

KEY DATA

- Land ownership: 38% of ranchers lack documentation to support their property, limiting their ability to invest in improvements.
 - Without documentation: 37 ranches (least secure).
 - *Ejidal* document: 18 ranches (moderately secure).
 - Property title: 43 ranches (secure).
- Livestock economy: 60% have mixed livestock (goats and cattle). Ranchers with land titles reported greater economic recovery.
 - Single livestock ranch: 15 goats, 24 cattle.
 - Mixed herd: 59 ranches.

CLIMATE IMPACTS AND ADAPTATION STRATEGIES

- During the drought:
 - Ranchers diversified livestock feed, increasing the use of purchased feed, especially alfalfa.
 - They sold assets, took out loans or used savings to cover costs.
 - Most affected regions: Goat ranches reported the greatest negative impacts.



→ Economic recovery:

- Household economic recovery is positively associated with improvements in herd size and increased alfalfa purchases.
- The Giganta Norte region records greater ranch economic recovery relative to the other two regions.

→ After the rains (2022):

- Recovery in ecosystem health and herd size was observed, especially in Sierra La Giganta Norte.

CONCERNS ABOUT THE FUTURE

→ 68% of ranchers surveyed are very concerned about future prolonged droughts, while 22% are somewhat concerned.

→ On average, they believe they could withstand two to three years before abandoning ranching.

OPPORTUNITIES TO STRENGTHEN RESILIENCE

→ Interest in economic diversification:

- 97% are willing to participate in conservation projects.
- 90% would support rural tourism initiatives..

→ Needs identified by ranchers:

1. To count on economic opportunities that allow them to have secure work and diversify their sources of income.
2. To find food alternatives and have sufficient agricultural infrastructure to grow fodder and store food.
3. To have access to effective government support to generate employment and improve agricultural and general infrastructure, e.g. electricity.
4. Increased rainfall and water conservation strategies.



Adaptive responses to extreme drought:

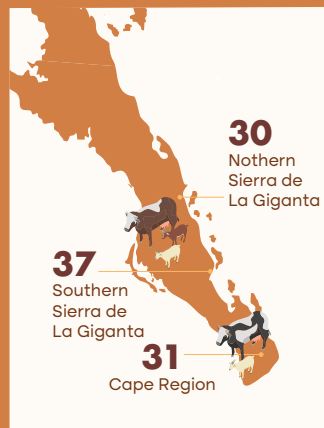
A case study of rural ranchers in Baja California Sur, Mexico

Ranchers have proven to be ready to adapt to extreme droughts and diversify their sources of income, but they need support to face the challenges of the future. Analyzing these elements is key for policymakers to:

- Prioritize assistance to the most vulnerable communities
- Assess their resilience
- Identify replicable strategies in other contexts

Survey (April and May 2024):

Semi-structured interviews were conducted in **98 rural ranches** in three regions:

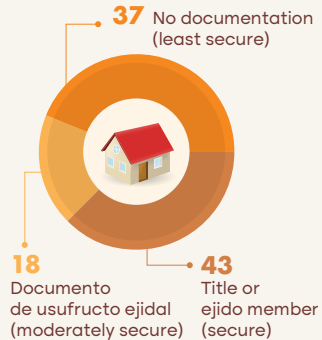


Objective:

To analyze how traditional ranchers in Baja California Sur responded to an **extreme drought occurred between 2020-2022**, evaluate their **resilience** in a context of increasing ecological uncertainty, and the extent to which **new economic opportunities** may contribute to their cultural resilience.

Condition of surveyed ranches

Rural economy under pressure



Livestock economy

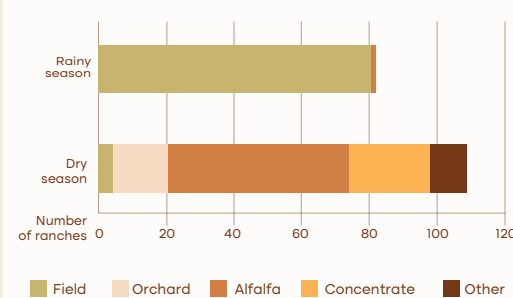


Key data

- The size of the goat herd varies by **family size** and **region** (the largest in Southern Sierra de La Giganta).
- The size of cattle herd depends on the **land security** (larger on ranches with clear land title or who are ejido members) and **region** (largest on ranches with secure land) and the **region** (the largest in Northern Sierra de La Giganta).

Behavioral change and responses to drought

Alimentación del ganado Livestock feed (cattle and goats)

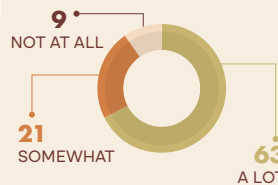


In the rainy season: Ranchers depend mainly on the field to feed their herds.

In dry season: They increase the amount of purchased feed compared to the rainy season, and diversify feed sources, with alfalfa gaining importance.

Uncertainty in the face of prolonged droughts and identified opportunities

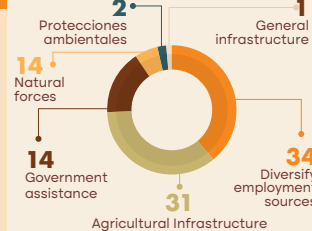
Concern about future droughts:



Diversification of economic opportunities:

- ▶ **97%** are interested in working in **conservation** as an economic alternative.
- ▶ **90%** want to participate in **rural tourism projects**.
- ▶ **29%** want to be in a **Natural Protected Area**, while **61%** do not want to.

Needs identified by ranchers:



Perceived impacts of drought:

- Ranches with larger goat herds report significantly worse impacts.
- Ranches from the Southern Sierra de La Giganta reported fewer negative impacts relative to the other two regions.

Economic recovery

• **Economic recovery** of ranches is positively associated with improvements in **herd sizes**.

- The Northern Giganta reports greater ranch economic recovery relative to the other two regions.

Increased herd sizes

• The improvement in herd size is associated with greater **alfalfa purchasing** and with **ecosystem recovery**.

Ranchers suggest they can withstand between **2-3 years of sustained drought** before they will be forced to abandon ranching.

How to strengthen the resilience of traditional ranchers?

1. Promote additional **economic opportunities**, such as tourism or conservation projects.
2. Improve **agricultural infrastructure** for food production and storage.
3. Promote **effective government assistance** that responds to the real needs of rural communities.



RECOMMENDATIONS

- ✓ Promote economic alternatives: Integrate rural tourism and conservation projects as additional sources of income.
- ✓ Strengthen agricultural infrastructure: Focus on fodder production and storage to mitigate future droughts.
- ✓ Promote effective government programs: Design support that responds to the real needs of these vulnerable communities.

What is next?

This study is the first step in understanding the social and environmental impacts of droughts in Baja California Sur. The results will serve as a basis for informed public policies and individual actions that:

- Reduce the risks of future droughts.
- Promote the recovery of ecosystems and communities.
- Guarantee the sustainability of the traditional ranching culture in the region.
- Channel the strategic support necessary to convert the adaptive capacity of traditional ranchers into long-term sustainability.
- Support and proliferate alternative economies on the ranches, e.g. cultural tourism and the sale of artisanal crafts.
- Strengthen non-profit associations that work with rural communities and the conscious protection of the environment.



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