

Introduction

In the Ecuadorian Andes, approximately 70% of the rural population relies on agriculture and livestock for their livelihood. Prolonged droughts have severely impacted these activities, as farmers lack water management knowledge. Scarcity of information about irrigation systems has decreased production and caused significant economic and social impacts on communities. In this context, the use of soft information is a key approach to evaluate drought management strategies in Andean irrigation systems with limited data.



Figure 1. Agriculture in the Ecuadorian Andes

Methods

The Quebrada Santul irrigation system is a representative example of the Andean irrigation systems in Ecuador. It is located at 2,700 m.a.s.l., with temperatures ranging from 12 to 20 ° C. The system serves 111 users and irrigates 60 hectares. The irrigation methods used are gravity and sprinkler irrigation. The main crops include corn, beans, vegetables, grasses, fruit, and potatoes.



Figure 2. Study site Quebrada Santul irrigation system

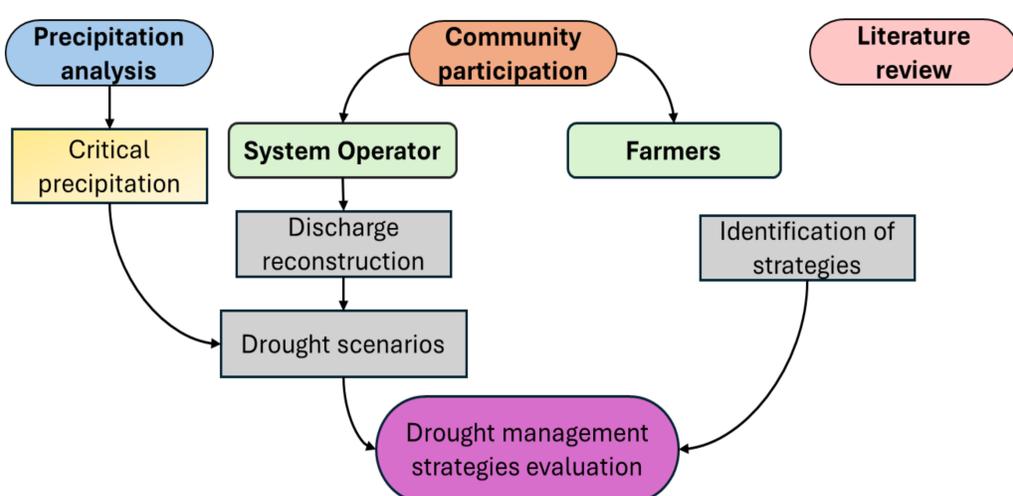


Figure 3. Conceptual map of the methodology

Results

- 1 Sectorized reservoir tanks/micro-reservoirs
- 3 Change of irrigation infrastructure
- 4 Parcel irrigation/efficient irrigation installation
- 11 Shift to less water-demanding crops
- 12 Implementation of irrigation shifts/schedules
- 20 Deficit irrigation

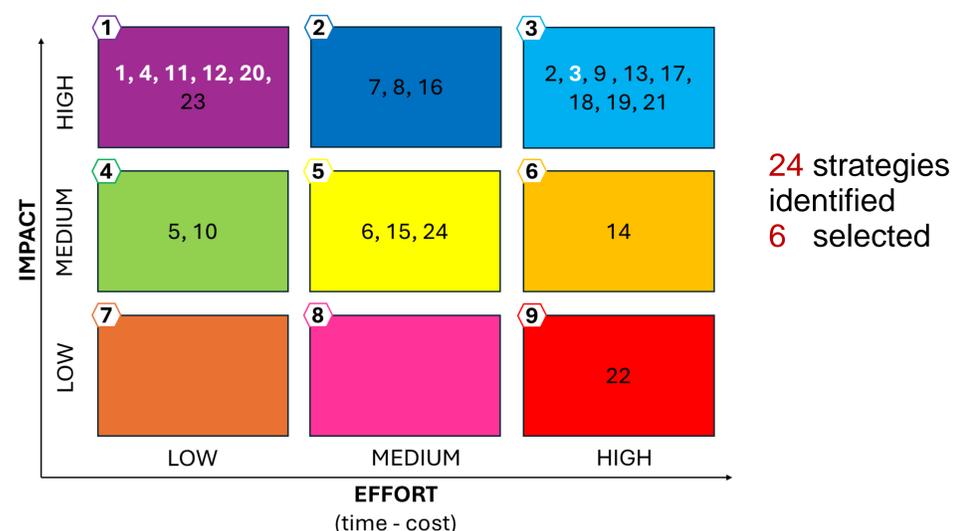


Figure 4. Strategies identified and selected

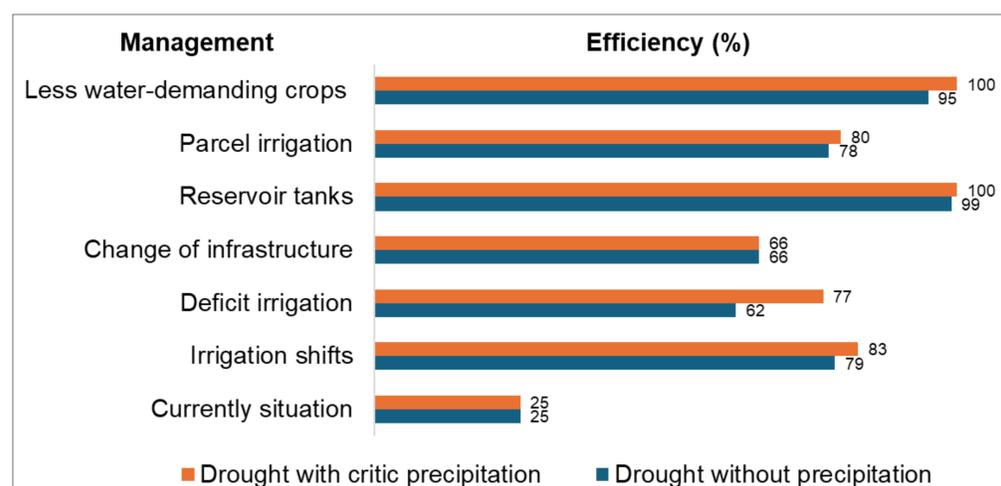


Figure 5 Evaluation of strategies in two drought scenarios

Conclusions

A combination of soft data, modeling, and farmer's participation is essential to generate sustainable solutions to droughts.

Effective drought management in the Andes requires combining local practices, modern technology, and strategic planning.

Assessing the viability of strategies in terms of their technical, financial, and expertise sustainability is crucial to ensure their long-term success.

Recommendations

These strategies should be combined with other policy level strategies to assess impact.