

# From Uncertainty to Insight: Applying the Delphi Technique in Goat Farming Development

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## Abstract

Goat farming remains a vital livelihood activity for smallholder farmers, yet it faces persistent challenges due to climate variability, market uncertainty, and limited access to scientific knowledge. In such complex environments, decision-making requires more than traditional approaches. The Delphi Technique offers a systematic method of harnessing expert knowledge to guide planning and innovation. This article reflects on the application of the Delphi Technique in goat farming, highlighting its role in identifying constraints, forecasting trends, and designing effective extension strategies. Facilitating consensus among experts, it provides a reliable foundation for improving productivity, sustainability, and livelihood security.

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## Introduction

Goat farming has long been regarded as a resilient and accessible livelihood option for rural communities, particularly for small and marginal farmers (Verma et al., 2026a). Its low investment requirements, adaptability to harsh environments, and quick economic returns make it an essential component of rural development (Verma et al., 2026b). Yet, beneath this apparent simplicity lies a complex system influenced by fluctuating markets, changing climatic conditions, disease outbreaks, and evolving management practices. Farmers often make decisions based on experience and local knowledge, which, although valuable, may not always be sufficient to address emerging challenges (Verma et al., 2025). As uncertainty increases, the need for structured and forward-looking decision-making tools becomes more evident. It is in this context that the Delphi Technique gains relevance, offering a scientific and systematic approach to understanding future possibilities through expert consensus.

## Understanding the Need for Expert-Based Forecasting

In goat farming, challenges rarely exist in isolation. Issues such as feed scarcity, disease prevalence, and market fluctuations are interconnected and influenced by external factors. Traditional extension approaches often focus on transferring existing knowledge, but they may fall short in anticipating future problems or identifying emerging opportunities. The Delphi Technique addresses this gap by bringing together experts from diverse fields such as animal science, veterinary medicine, extension education, and rural development. By combining their insights, it creates a broader and more informed understanding of the sector. This collective intelligence allows stakeholders to move beyond reactive decision-making and adopt proactive strategies that are better suited to dynamic conditions.

## Applying the Delphi Technique in Goat Farming

The application of the Delphi Technique in goat farming begins with the identification of a specific issue (Dalkey & Helmer, 1963), such as improving productivity, managing disease risks, or enhancing market access. A panel of experts is then selected based on their experience and knowledge in relevant areas

(Linstone & Turoff, 1975). Through a series of structured questionnaires, these experts share their opinions on key issues, challenges, and potential solutions. The responses are carefully analysed and summarised, and feedback is provided to the participants. In subsequent rounds, experts are encouraged to reconsider their views in light of the collective responses (Okoli & Pawlowski, 2004). Over time, this iterative process leads to a convergence of opinions, resulting in a consensus that reflects a well-rounded perspective. In goat farming, such consensus can help identify priority areas for intervention, recommend best practices, and guide policy decisions.

#### Identification of Problem

(e.g., low productivity, disease issues, market constraints)



#### Selection of Expert Panel

(Animal scientists, veterinarians, extension experts, economists)



#### Round 1: Initial Questionnaire

(Collect expert opinions on challenges & solutions)



#### Analysis of Responses

(Summarize key issues, trends, and suggestions)



#### Feedback to Experts

(Provide anonymous summary of group responses)



#### Round 2: Revised Responses

(Experts review and refine their opinions)



#### Repeated Rounds (if needed)

(Consensus building through iteration)



#### Final Consensus

(Priority interventions identified)



#### Application in Goat Farming

Improved breeding strategies  
Better feeding practices  
Disease control measures  
Market linkage strategies



#### Impact

Enhanced productivity, income, and livelihood security

#### Insights Generated through the Delphi Approach

One of the most valuable outcomes of the Delphi Technique is its ability to generate actionable insights. In the context of goat farming, it can help identify critical constraints such as inadequate veterinary services, poor genetic quality, and limited market access. At the same time, it highlights opportunities for improvement, including the adoption of improved breeds, better feeding practices, and the use of digital extension tools. The technique also allows for the prioritisation of interventions, ensuring that resources are allocated efficiently. By focusing on the most pressing issues, extension agencies and policymakers can design programs that have a greater impact on farmers' livelihoods.

#### Strengthening Extension Strategies

The integration of Delphi findings into extension education significantly enhances the effectiveness of extension strategies. Instead of relying solely on generalised recommendations, extension programs can be tailored to address specific challenges identified through expert consensus. For instance, if the Delphi process highlights disease management as a priority area, extension efforts can focus on improving veterinary services, promoting vaccination programs, and raising awareness about preventive healthcare. Similarly, if market access emerges as a key issue, interventions can be designed to strengthen value chains and improve farmers' bargaining power. This targeted approach ensures that extension services are not only relevant but also responsive to the actual needs of farmers.

#### Advantages in the Context of Goat Farming

The Delphi Technique offers several advantages when applied to goat farming. Its structured and systematic nature ensures that decisions are based on comprehensive and well-analysed information. The anonymity of participants reduces bias and allows experts to express their views freely, leading to more objective outcomes. Moreover, the technique is particularly useful in situations where empirical data is limited or uncertain. In many rural contexts, reliable data on livestock systems may not be readily available, making expert judgment an essential resource. The Delphi Technique effectively harnesses this resource to support informed decision-making.

#### Limitations and Practical Considerations

Despite its strengths, the application of the Delphi Technique requires careful planning and execution. The selection of experts is critical, as the

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quality of the results depends largely on their knowledge and experience. The process can also be time-consuming, especially when multiple rounds are needed to achieve consensus. Additionally, the interpretation of results requires skill and objectivity to ensure that the findings are accurately represented. While these challenges exist, they can be managed through proper design and facilitation, making the technique a valuable tool in the long run.

### Future Perspectives

As goat farming continues to evolve, the need for innovative and forward-looking approaches becomes increasingly important. The integration of digital technologies with the Delphi Technique offers new possibilities for real-time data collection and analysis. Online platforms can facilitate faster communication among experts, reducing the time required for the process. In the context of climate change and market uncertainty, the ability to anticipate

future trends will be crucial for sustaining livelihoods. The Delphi Technique, with its focus on expert consensus and strategic planning, is well-positioned to play a key role in shaping the future of goat farming.

### Conclusion

The challenges faced by goat farmers today require solutions that are both innovative and evidence-based. The Delphi Technique provides a powerful framework for addressing these challenges by combining expert knowledge with structured analysis. Enabling informed decision-making and strategic planning, it helps transform goat farming from a traditional livelihood activity into a more resilient and sustainable enterprise. As extension systems continue to evolve, the integration of tools like the Delphi Technique will be essential for achieving long-term development goals and improving the livelihoods of rural communities.

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