

# Sustainable Livestock Projects in Honduras: Specialists' Insights on Current Challenges, Effective Strategies, and Successful Experiences

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## Abstract

In Honduras, sustainable livestock practices [SLPs] are gaining attention as strategies to address environmental degradation and improve rural livelihoods. However, their implementation and scaling remain uneven. This qualitative case study explores the perspectives of ten development specialists engaged in national livestock projects, examining how human and social capital influence program success. Guided by the Sustainable Livelihoods Framework [SLF], data were collected using a combination of semi-structured interviews, document reviews, and field observations. Data analysis highlighted the challenges, strategies, and contextual factors shaping the outcomes of sustainable livestock interventions. Findings reveal persistent barriers to adoption, including limited producer engagement, resource constraints, and market-related challenges. Despite these obstacles, participants described effective approaches such as Farmer Field Schools (FFS), participatory training methods, and strong institutional partnerships. Technical expertise and collaborative networks were key factors contributing to positive outcomes. Producer organizations also played a vital role in facilitating market access and strengthening collective action. The study concludes that sustainable livestock development must go beyond technical training to institutional strengthening, value chain integration, and local adaptation. Recommendations include expanding participatory learning methods, enhancing access to financial and technical support, and fostering inclusive decision-making for long-term sustainability.

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## Introduction and Problem Statement

Agriculture, forestry, and fishing remain pillars of Honduras, contributing 2.82 billion USD, or 12.4%, to the country's GDP in 2019. Within this sector, livestock production represents about 13% of the agricultural value (Ministerio de Agricultura, Pesca y Alimentación, 2021). Despite its economic importance, productivity challenges persist. For instance, milk yields and income per cow decrease by 41% during the dry season compared to the rainy season, highlighting the vulnerability of livestock systems (Lentes et al., 2010).

Small producers manage 56% of the national herd but face challenges, with 46% of farms under five hectares and 90% operating at low productivity. Additionally, 80% lack access to formal credit, and poor land management practices contribute to 32% of the nation's greenhouse gas emissions (Canu et al., 2018; Flores Agreda et al., 2020; Sandoval et al., 2025).

Sustainable livestock practices [SLPs], such as improved forages, rotational grazing, and silvopastoral systems, offer inclusive solutions that boost productivity and soil fertility while supporting Net-zero goals (Davies et al., 2013; Moran & Blair, 2021; Rosen et al., 2025). In contrast, non-SLPs like overstocking, continuous grazing, and excessive chemical use degrade soil, reduce biodiversity, and threaten long-term productivity (Robinson, 2024).

Adopting SLPs requires more than technical availability; knowledge transfer, producer engagement, and contextual adaptation are critical (Pandey et al., 2021). Specialists, including agronomists, veterinarians, and extension professionals, play a pivotal role, as their ability to design relevant interventions and promote adoption often determines project success (Peters & Hoffmann, 2010; Yusuf et al., 2020)

Although SLPs exist in Honduras, their scaling and long-term impact remain limited (Hameleers et al., 2020; Mitigation Action Facility, n.d.). This study addresses that gap by examining how specialists involved in livestock development projects understand and support adopting sustainable practices in the field.

## Theoretical and Conceptual Framework

This study is guided by the Sustainable Livelihoods Framework [SLF], a comprehensive approach for understanding and enhancing people's livelihoods to reduce poverty (Ashley & Carney, 1999). The SLF is based on six core principles: it prioritizes people, is responsive and participatory, operates at multiple levels, involves partnerships, focuses on sustainability, and is dynamic. These principles align with the research aim of understanding the perspectives of Honduran specialists from various organizations working on SLPs, particularly their insights on challenges, successes, and future directions (Serrat, 2017).

SLF categorizes livelihood assets into five key types: human, social, natural, physical, and financial capital. These assets are shaped by transforming structures and processes, where

structures include government agencies and the private sector, and processes refer to institutions, policies, and power relations that influence access to and use of resources (Serrat, 2017). These components shape livelihood strategies and affect important outcomes, including enhanced well-being, reduced vulnerability, increased income, and more sustainable resource use.

Applications of SLF in other sectors have demonstrated its value in identifying factors that influence the success of development interventions. In rural tourism and conservation, the framework has helped highlight barriers to participation, equity, and livelihood capabilities (Munanura et al., 2016). Smallholder farmers have diverse household needs, allowing for more targeted and inclusive interventions (Cramb et al., 2004). Aquaculture systems have served as a diagnostic tool to understand how access to various livelihood assets shapes farming strategies and outcomes, providing insights into pathways for strengthening rural livelihoods (Ahmed et al., 2008).

In Honduras, the livestock sector supports thousands of rural families but faces structural and environmental barriers to transformation (Mitigation Action Facility, n.d.). Using the SLF as a guiding lens, this study examines how development practitioners navigate these challenges and leverage their human and social capital to promote SLPs. This framework supports a deeper understanding of the contextual and structural dynamics that influence program implementation and contributes to identifying actions for improving livestock systems in resource-limited settings.

## Purpose

This qualitative study aims to understand specialists' perspectives on SLPs in Honduras. It explores specialists' insights regarding challenges, practical farmer engagement, training strategies, and successful experiences in implementing SLPs. Three objectives guided the study aims: (a) to understand the challenges of implementing SLPs; (b) to examine effective strategies for engaging and training livestock farmers; and (c) to explore successful experiences in implementing SLPs.

## Methods

This qualitative case study explored specialists' experiences with SLPs in Honduras, focusing on contextual factors and individual perspectives (Creswell & Creswell, 2017). Guided by a constructivist interpretative lens, the research emphasized knowledge as socially constructed through participants' experiences (Creswell & Poth, 2016). Before data collection, the University of Florida's Institutional Review Board [IRB] approved the study (IRB 202401362).

### Data Collection

In this research, a specialist is defined as an individual with expert knowledge and practical experience in SLPs, recognized through formal training and professional roles in developing,

implementing, or evaluating related initiatives. Additional qualifications, such as affiliation with government agencies, development organizations, or universities, further reinforced their recognition as experts (Food and Agriculture Organization of the United Nations [FAO], 2025; Kahan, 2013). Ten male specialists were purposively selected and invited to participate via email based on their roles in a current national SLPs. Inclusion criteria required at least two years of experience in SLPs in Honduras, direct work with farmers or extension agents, and a technical degree in agriculture or related fields, ensuring representation of different institutional perspectives in SLPs (Creswell & Creswell, 2017).

A 15-question interview guide based on the SLF was created to explore the challenges, strategies, and successes in SLPs (Creswell & Poth, 2016). Questions were reviewed by two specialists who did not participate in the interview. They supported the study by reviewing, clarifying, and ensuring the relevance of the topics. Semi-structured interviews were conducted in person, via Zoom, and via WhatsApp. The lead researcher used follow-up probes to explore context-specific examples and clarify responses during the interviews. The interviews ranged from 20 to 40 minutes. All interviews were audio-recorded and analyzed in Spanish to preserve participants' original expressions and meanings (Archibald et al., 2019; Creswell & Creswell, 2017; Saldaña, 2021).

The lead researcher reviewed internal documents and training materials to triangulate the data. Participatory and non-participatory observations supplemented this during interviews and training sessions. The three researchers also provided analytical memos reflecting on potential themes, which were cross-checked during two debriefing sessions to validate interpretations and reduce bias (Lincoln & Guba, 1985; Saldaña, 2021).

### Data Analysis

Open coding was first applied to capture key concepts without preset categories, followed by pattern coding to group related codes into broader themes aligned with research objectives (Miles et al., 2014; Saldaña, 2021). The first and second authors independently reviewed transcripts, developed initial codes manually, and iteratively refined them through collaborative meetings. This process resulted in themes reflecting specialists' core insights on project development, training strategies, and implementation challenges in SLPs.

### Trustworthiness

Trustworthiness was accomplished by addressing credibility, dependability, confirmability, and transferability (Lincoln & Guba, 1985). Credibility was established by triangulating the transcripts with documents and observations (Patton, 2014). Dependability was supported by a detailed audit trail and code reviews during data analysis (Nowell et al., 2017). Confirmability was accomplished by involving multiple researchers in coding and cross-verifying findings (Shenton, 2004). Transferability was achieved through purposive sampling, enabling readers to evaluate applicability to other settings (Lincoln & Guba, 1985).

### Researcher's Subjectivity Statement

The research team has a shared background in agricultural education and extension in Latin America, especially Honduras. All three researchers studied at a Honduran agricultural university, providing strong regional expertise. The lead author participated in multiple local extension programs. Although some contextual nuances may have been missed, the team's deep knowledge of local practices, institutions, and culture likely minimized gaps, enabling a more informed interpretation of the data and livestock professionals' needs.

## Findings

### Objective 1: Implementation Challenges

#### **Engagement Barriers**

One of the main challenges in implementing SLPs relates to producers' varying attitudes, levels of motivation, and past experiences with external support. Six participants noted that a lack of trust in projects due to unmet expectations from previous initiatives has hindered producer engagement. P1 stated, "Later, it's about awakening people's interest. Many organizations have come into the communities and raised false expectations among people. So much so that some no longer believe in the projects." Past project failures have fostered skepticism among producers, hindering trust and engagement in new initiatives.

P2 emphasized the difficulty of helping producers understand the broader transformation needed in livestock systems, especially concerning environmental issues. He mentioned: "The other challenge has been getting livestock producers to understand the transformation the system needs to undergo, since on the environmental side, I think they have felt it more." This perspective aligns with P3, who reflected on the challenges of introducing sustainable practices to new communities: "Initial challenges are related to adoption, because in the end we work with people, [...], arriving in an area and talking to them about an agroecological practice or about climate-friendly practices is not always well received at first..." This reflection highlights the need for gradual approaches when introducing new practices, especially in communities unfamiliar with sustainability concepts.

Another barrier to implementation is the lack of initiative and openness among some producers. P5 described this dynamic by stating, "First of all, the idiosyncrasy of the human being. Not all producers have the vision to improve. You try to help some of them, and they won't let you help; they don't have the initiative to improve." In addition to individual attitudes, weak organizational structures among producers further limit progress.

#### **Resource Constraint**

Participants identified limited financial access and weak technical support as key challenges to implementing SLPs. P1 explained, "Securing financing that fits the sector has been difficult. In Honduras, there is the FIRSA [Trust Fund for the Honduran Agri-Food Sector Reactivation Program], but access is available only to large-scale livestock producers. Medium or small-scale

producers don't have the same access." This quote highlights the financial access gap; small and medium producers are often excluded from programs meant for larger operations.

Moreover, a decline in technical assistance was emphasized as an important factor affecting producers. P2 stated, "Lack of technical assistance has been an important factor. In Honduras, technical assistance and research in recent years have declined, right? And the producers have been somewhat neglected, which has had an impact." This quote shows that reduced institutional support leaves producers without guidance to improve their practices.

P5 described how some producers receive temporary aid from projects or donations but fail to maintain changes once the support ends: "Projects come in, donations, and sometimes the producer receives that help, and suddenly they just take advantage of the movement. Once the help is gone, they go back to the same. They didn't know how to take advantage of it." Finally, the cost of technical assistance was raised as a limiting factor by P10, who said, "The cost of technical assistance is quite limiting." This quote shows how high technical assistance costs prevent producers from accessing support to implement SLPs.

### ***Commercial Challenges***

Challenges related to market dynamics and commercialization emerged as significant obstacles for producers. Seasonal fluctuations in production and prices create instability that affects producers' incomes and investment capacity. P1 noted, "Of the 100% of production in the winter, it drops to 60% in the summer, due to the lack of forage, so the milk price is much better in the summer." This insight reveals how seasonal variability in forage availability impacts production levels and market prices, complicating financial planning for producers.

Specialists also described issues related to market structure and the role of intermediaries. P4 explained, "So the intermediaries are basically the ones who benefit from the producer's hard work." Economic survival is another concern, with some producers operating without detailed knowledge of their costs. As P5 shared, "There are some who don't even calculate their costs; they're producers who survive, as they say. Just living by God's hand, as we say here in Honduras." This quote highlights the fragile nature of small-scale livestock production, where poor financial literacy and planning threaten sustainability.

Product quality was also identified as a critical challenge. P7 stated, "There are product quality challenges. Most products, especially milk, do not meet the accepted quality or safety standards to be competitive. So, there's a lot of work to do at the product quality level as well." Lastly, P10 highlighted the difficulty that price fluctuations pose for investment, saying, "That fluctuation in prices is a problem when we think in terms of investments that livestock producers can make." This quote shows how market volatility hinders long-term investments, limiting producers' ability to adopt new technologies.

## Objective 2: Effective Training Strategies

### ***Farmer Field School [FFS] Methodology***

Participants emphasized the FFS as a significant approach for training and technology transfer in the Honduran context, especially for Sustainable livestock training. P2 stated: “Well, in Honduras, the FFSs are well-known [...] I believe it's currently the most effective system for technology transfer and training in the country, when it is well understood, well managed, and clearly conceptualized.” This quote highlights the perceived effectiveness of FFS, positioning it as a leading method for agricultural extension.

P3 also supported the FFS approach, particularly highlighting the inclusion of community leadership: “I think the best strategy is the FFS approach, especially with the added component that Heifer includes: the training of a promoter in each FFS.” The practical application of FFS was also described based on outreach and producer engagement. P7 said:

Through the FFS, which is a methodology promoted by the FAO and which we, as a university, have put into practice here in Honduras, we can provide training and technology transfer to groups of producers from one or more communities, usually with common problems, and we conduct the training out in the field.

P8 reflected on a participatory, hands-on model of extension work conducted within producers' environments. He mentioned:

Well, I believe what the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) is doing, starting the design of these FFS and reintroducing them at the producer level, is an important first step. Because it must start that way, by spreading the word and teaching the producer. Reaching out to them as well so they can become familiar with what sustainable livestock farming is all about.

P10 offered a broader reflection on the evolution and adaptation of FFS methods across sectors and institutions:

With the Pasture team, it took us a year and a half to philosophize and honestly talk much crap about how to do extension in livestock. CATIE conducted experiences using a version of FFS for coffee growers, although they didn't call it FFS. We were also looking at what FAO was doing, FFS in agriculture specifically, and what Zamorano was doing through Programa de Manejo Integrado de Plagas in Central America, with horticulture field schools.

This quote illustrates FFS development's iterative and cross-sectoral nature, showing how lessons from other agricultural domains inform livestock extension strategies.

### ***Practical and Contextualized Learning***

Participants expressed the importance of delivering training in a practical and context-specific manner that enables producers to apply knowledge to their own farms. P1 explained:

Another way to motivate them is to do the workshops and training sessions in a hands-on, practical way. If there's a workshop on planting improved pasture, then the practice is done, and everyone gets the same materials to replicate it themselves.

P3 also stressed the importance of implementation and demonstration: "Taking them to learn about these topics related to SLPs, so they can implement them on their own farms and demonstrate the changes, becomes a great way to make sure the methodology works." Such demonstrations ensure that producers learn new methods and gain confidence in applying them effectively.

As part of the lead researcher's notes, he wrote that during the planning meeting, experts prioritized the development of training materials tailored to the specific needs and contexts of the regions they aimed to serve. This observation aligned with participants' descriptions of how training was adapted to local realities.

### ***Active Participation of Producers***

Participants emphasized that producer engagement is most effective when the training is grounded in local realities and shaped by the producers' needs and experiences. P1 noted: "The other thing is, for trainings to be engaging, the topics must be relevant and related to the problems the producers are facing. So usually, the training is based on issues they identified in their region." P3 described how field days and demonstration sites are used to promote learning through observation and peer influence:

During a field day, several topics are covered at a demonstration farm that hosts a field school. The field school members attend, the promoter is a facilitator, and a Heifer livestock technician is present. They observe how the farmer has made changes, which inspires others to implement similar changes.

These insights were further supported by an FFS guidebook provided to the researcher, which clearly recommended active participation by incorporating local knowledge. P7 supported this analysis, he stated: "We also take into account the local knowledge, the producers' own knowledge." Participant 10 further explained how structured group engagement supports producer participation: "FFS is the middle ground. A full-time facilitator working exclusively with FFS can work with about 100 producers; they can manage five schools of 20 participants each [...], allowing them to provide a level of group support that facilitates change." Finally, P10 raised a concern about ensuring active participation in training; otherwise, it will not create change in the producers. He noted:

When the approach becomes about designing a curriculum and rewarding changes on the farm based on that curriculum, it loses efficiency. Because we end up gathering producers under a tree so we can say we're in the field, but we're basically giving them a regular lecture, we're just informing them, not promoting change.

## **Objective 3: Successful Experiences**

### ***Producer Organization and Collective Structures***

Specialists shared successful experiences in project design that highlighted the long-term benefits of organizing producers into formal and collaborative structures. P1 cited the Federation of Livestock Farmers and Agricultural Producers of Southern Honduras (FEGASUR) as

an example of institutional development that has emerged directly from project work. During our analysis of online sources, we examined the official FEGASUR website, noting its significance for governance and ongoing livestock initiatives that support small farmers. P1's explanation clearly illustrates this analysis:

The first one is the organization I'm currently working with, FEGASUR. It's a success story because it emerged from a project. It has grown to the point that it now has legal status, its own office, and it elects a new board of directors every two years.

P6 described a long-term effort to build producer capacity through the FFS model, facilitated by the National University of Agriculture (UNAG): "They were called FFS through UNAG. We worked for about eight years, around six of them continuously, training producers under the FFS methodology systematically and uninterruptedly, organizing them, training them with a multidisciplinary team, going to their communities, and bringing them to specialization levels through certificate programs, exchange visits to other farms, even in other countries, and promoting business incubation." This highlights the value of sustained, systematic training in building producer skills, networks, and entrepreneurial capacity.

### ***Technical Innovations for Sustainability***

Six specialists emphasized the value of technical innovations that improve ecological outcomes and farm efficiency as core components of successful livestock projects. P2 described the *Biosfera* case as a transformative example of integrating sustainable land management into livestock systems:

The *Biosfera* case is interesting. Farmers with large farms and a well-diversified system that includes forest, water catchment areas, grazing land, pastures, and crops. The area previously used for intensive cropping is now being transitioned into intensive livestock systems; they need less pasture to maintain the same number of animals. So, these pastures are being converted into what the project calls 'transition paddocks', areas moving into regeneration, with more trees and greater ground cover. This is truly impactful; we're talking about over 600 hectares that are at least starting to be transformed. And what's most interesting is that producers aren't talking about increasing herd size but transforming the land.

To support this quote, a review of *Biosfera's* official communication documents confirmed the region's ongoing efforts to improve land use through regeneration practices and silvopastoral systems, reinforcing the specialist's perspective.

Other technical innovation examples included milk quality improvements through cold chain management. P7 noted that farms delivering chilled milk achieve better prices:

For example, after Hurricane Mitch, work was done with the U.S. cooperative, and at this point, we can say that the establishment of the milk collection and cooling centers, known as CRELs, of which there are more than a hundred in the country, is a success story. These are groups of producers who bring their milk to a single location, cool it, right?, and sell it, in this case, to the industry. They can negotiate based on volume by pooling the milk together, right? It's not the same for one producer to offer a hundred

liters as for the CREL to offer three or four thousand liters, right? So, volume becomes a negotiating power.

P9 reinforced the role of grazing management practices as a technical solution with major productivity benefits: “Rational grazing, I've worked on it before with International Center for Tropical Agriculture, increases pasture area efficiency threefold, if not fivefold.” Such innovations show how technical strategies, when implemented effectively, can increase resource efficiency and contribute to the broader goals of sustainable livestock systems.

## Conclusions, Discussion, and Recommendations

This study concludes that while SLPs are gaining traction, their implementation is hindered by persistent barriers such as limited producer engagement, resource constraints, and market-related challenges. However, this study also explored strategies such as FFS methodology and specific training approaches that have effectively promoted adoption. Successful experiences, including producer organizations and technical innovations, demonstrate the potential for sustainable livestock systems when supported by human and social capital.

The results highlight the need to understand socio-cultural and institutional contexts for SLPs. The SLF provided a valuable lens for analyzing how specialists leverage human and social capital to navigate complex development environments. Human capital was reflected in technical expertise and training, while social capital is manifested through networks and partnerships (He & Zhang, 2025).

The study also confirms that participatory and experiential learning approaches are particularly effective in the Honduran context. These methods facilitate knowledge transfer and empower producers by valuing local knowledge and fostering learning (Gómez et al., 2025; Paleologo et al., 2025). However, the success of such approaches depends on sustained institutional support, adequate funding, and the presence of trained facilitators.

Moreover, this research emphasizes producer organizations and collective action, as seen in the cases of FEGASUR and CRELS, which illustrate how structural support can enhance market access, improve product quality, and increase bargaining power. These examples suggest that sustainable livestock development must go beyond technical training to institutional strengthening and value chain integration.

To improve the effectiveness of SLPs, it is crucial to rebuild trust and foster active engagement among producers by involving them in project planning and decision-making (Kazanski et al., 2025). Expanding the FFS methods is recommended because it is an effective, participatory approach for training and technology transfer, especially when adapted to local conditions.

Enhancing access to financial and technical resources is also essential, particularly for small and medium-scale producers who often face economic challenges. This might include developing

credit programs and revitalizing public technical assistance through partnerships with universities and NGOs. In addition, supporting producers' associations or cooperatives can strengthen collective action, improve market access, and increase bargaining power.

Future research should assess the long-term impact of participatory training models, such as FFS, on sustaining behavioral change and improving productivity among small-scale producers. Comparative studies of extension approaches could help identify context-specific strategies that enhance adoption. Additionally, research should explore the governance, leadership, and financial sustainability of producer organizations, and emphasize inclusive practices that support the meaningful participation of women and youth across the SLP chain, including specialists, helping to identify barriers and opportunities for equitable involvement.

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