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Smallholder Inclusion or Subordination? Power Relations, Value Distribution, and Social Sustainability in Dairy Goat Value Chains: A Systematic Review

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Abstract. *Smallholder participation in dairy goat value chains offers livelihood opportunities, but market integration does not necessarily ensure equitable benefits or producer autonomy. This systematic review examines how value-chain governance, economic relationships, and institutional arrangements shape smallholder inclusion and social sustainability. Following PRISMA 2020 guidelines, Scopus and Web of Science searches identified 52 records, with seven studies included after screening and full-text eligibility assessment. The review focused on original empirical research published from 2016 onward concerning dairy goat production, marketing, and value-chain relationships. Studies were concentrated in Spain, particularly Andalusia, and the broader Mediterranean context, covering diverse production systems and methodological approaches. Findings show that production intensity does not consistently increase profitability, while cooperative marketing supports income stability and market coordination. Short supply chains, direct sales, and artisanal processing offer greater pricing autonomy and value capture. However, dependence on external inputs, aging farming populations, labor shortages, and institutional constraints remain evident. A five-dimensional framework covering bargaining power, decision-making participation, market access, price-setting autonomy, and economic benefit distribution indicates that market participation may coexist with structural dependence. However, limited direct evidence on bargaining power and benefit distribution prevents definitive conclusions about producer subordination. This review provides a framework for distinguishing market participation from substantive inclusion and identifies evidence gaps for socially sustainable dairy goat value chains.*

Keywords: *Dairy goat value chains, Smallholder inclusion, Power relations, Value distribution, Social sustainability, Value-chain governance*

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INTRODUCTION

Dairy goat farming plays an important role in rural livelihoods by providing income-generating opportunities, supporting household economic diversification, and contributing to the development of smallholder agribusiness systems. Beyond primary milk production, dairy goat value chains encompass interconnected activities involving input provision, production, milk collection, processing, distribution, and marketing. The organization of these activities influences not only production performance and market opportunities but also the capacity of smallholder farmers to capture economic value. In Indonesia, Lailia et al. (2020) identified opportunities for value addition in dairy goat supply chains while highlighting challenges related to milk supply, processing capacity, and market development. These findings indicate that improving farm productivity alone may be insufficient to strengthen smallholder livelihoods without considering the organization of production and marketing relationships.

Value-chain integration is frequently promoted as a strategy for improving smallholder market access, strengthening coordination, and enhancing economic performance. However, participation in organized markets does not necessarily translate into equitable economic opportunities or increased producer autonomy. Kilelu et al. (2017), examining dairy development in Tanzania, demonstrated that multi-stakeholder processes could improve horizontal and vertical coordination while their contribution to upgrading remained constrained by existing market structures and institutional conditions. Similarly, Birthal et al. (2017) found that participation in formal dairy value chains in India was unevenly distributed, with resource-rich farmers more likely to access formal marketing arrangements, whereas smaller producers remained more dependent on informal channels. These findings challenge the assumption that market integration automatically leads to improved smallholder welfare and suggest that the conditions governing participation are as important as participation itself.

The limitations of market-oriented inclusion become particularly significant when examined through the perspective of power relations. Gereffi et al. (2005) conceptualized global value-chain governance in terms of the coordination of economic activities and the relationships among firms occupying different positions within production networks. Within agricultural value chains, differences in control over information, market access, quality requirements, and commercial relationships may create unequal opportunities for

producers to influence economic decisions. German et al. (2020) critically examined inclusive business arrangements in agricultural value chains, emphasizing how structural conditions can constrain the realization of inclusive outcomes. In dairy systems, Nyokabi et al. (2023) demonstrated the relevance of power relationships, trust, and social networks in shaping milk-quality outcomes in Kenya. Together, these studies suggest that value-chain participation must be examined in relation to the governance structures and power asymmetries that influence farmers' economic agency.

Power relations are also closely connected to value distribution because actors occupying different positions within value chains may possess unequal capacities to influence commercial terms and capture economic benefits. Producers who depend heavily on external input suppliers, limited marketing channels, or intermediaries may face restricted bargaining opportunities, whereas collective marketing, direct sales, and independent processing can potentially strengthen their position. However, these arrangements do not necessarily generate equivalent benefits for all participating farmers. Differences in production scale, organizational influence, processing capacity, and market information may affect the extent to which economic value is retained at the farm level. Consequently, value creation and value capture should be analytically distinguished: increased production or aggregate value addition does not necessarily demonstrate that smallholders receive a proportionate share of the benefits generated within a value chain.

The relationship between power relations and value distribution has important implications for social sustainability. Barrientos et al. (2011) distinguished economic upgrading from social upgrading, demonstrating that improvements in economic performance do not automatically produce corresponding improvements in social conditions. Although their framework was developed in the context of global production networks, this distinction provides a relevant analytical perspective for examining agricultural value chains. In dairy goat farming, social sustainability can be understood through livelihood security, producer autonomy, equitable opportunities, meaningful participation, and the capacity of farming households and institutions to maintain their activities over time. Unequal bargaining relationships may constrain farmers' control over income and commercial decisions, while limited value capture may undermine their ability to invest in production, sustain livelihoods, or respond to economic uncertainty.

Conversely, more participatory governance and improved control over value-adding activities may contribute to stronger economic agency, although these arrangements may also involve additional labor, financial, and organizational requirements.

These relationships indicate that power relations, value distribution, and social sustainability should not be examined as isolated dimensions. Value-chain governance shapes opportunities for bargaining and decision-making; these opportunities may influence how economic benefits, costs, and risks are distributed; and such distribution can affect livelihood security, producer autonomy, and the longer-term continuity of farming systems. Importantly, these relationships are not necessarily linear or uniformly beneficial. Cooperative participation may improve market stability without ensuring equal influence over organizational decisions, while independent processing may increase pricing autonomy but simultaneously intensify labor and managerial responsibilities. Therefore, understanding whether dairy goat value chains promote smallholder inclusion requires attention to both economic outcomes and the institutional relationships through which those outcomes are generated.

Existing research provides important but fragmented insights into these issues. Studies specifically addressing dairy goat production have examined supply-chain development and value addition (Lailia et al., 2020), production-system characteristics and comparative efficiency (Morales-Jerrett et al., 2022), and resilience capacities in small-ruminant farming systems (Lizarralde et al., 2026). Meanwhile, broader dairy and agricultural value-chain research has investigated market inclusion and coordination (Birthal et al., 2017; Kilelu et al., 2017), power relationships (Nyokabi et al., 2023), and structural constraints on inclusive agricultural development (German et al., 2020). However, these different strands of research address distinct aspects of smallholder participation and do not, by themselves, establish how power relations, value capture, and social sustainability interact specifically within dairy goat value chains.

This fragmentation reveals a more specific research gap. First, dairy goat studies have provided evidence concerning production efficiency, farming systems, value addition, and institutional resilience, but the extent to which these outcomes reflect substantive smallholder inclusion remains insufficiently clarified. Second, although broader dairy value-chain research demonstrates the relevance of market coordination and power asymmetries, the transferability of these findings to dairy goat systems

requires careful assessment because production organization, processing opportunities, market structures, and institutional conditions may differ. Third, the available literature provides limited direct and comparable evidence regarding farmers' bargaining power, participation in commercial decision-making, control over prices, and the distribution of benefits among value-chain actors. Accordingly, a systematic synthesis is needed to identify what the existing empirical literature demonstrates, what can reasonably be interpreted from its findings, and which dimensions of inclusion remain insufficiently documented.

To address these gaps, this systematic review examines the relationship between power relations, value distribution, and social sustainability in dairy goat value chains. Smallholder inclusion and subordination are explored through five interrelated analytical dimensions: bargaining power, decision-making participation, market access, price-setting autonomy, and economic benefit distribution. The review aims to (1) synthesize empirical evidence concerning the economic and institutional arrangements shaping smallholder participation, (2) examine how these arrangements relate to producer autonomy and opportunities for value capture, and (3) identify the implications and evidence gaps concerning social sustainability. By integrating these dimensions, the review contributes a multidimensional analytical framework that distinguishes formal market participation from substantive inclusion while recognizing that opportunities for inclusion and conditions of structural dependence may coexist within the same value-chain system.

LITERATURE REVIEW

1. Value-Chain Governance and the Distribution of Power

Value-chain governance refers to the institutional and organizational arrangements through which economic activities are coordinated among actors involved in production, processing, and distribution. Governance determines how transactions are organized, how production requirements are communicated, and how responsibilities and commercial conditions are established across the chain. Gereffi et al. (2005) identify five types of global value-chain governance: market, modular, relational, captive, and hierarchy. These governance forms differ in the complexity of transactions, the extent to which information

can be codified, and the capabilities of suppliers, resulting in different levels of coordination and power asymmetry.

In agricultural value chains, these governance arrangements influence the relative positions of producers, input suppliers, milk collectors, processors, cooperatives, and market intermediaries. Smallholder dairy goat farmers may depend on external suppliers for feed and other production inputs, while simultaneously relying on collectors, cooperatives, or processors for milk commercialization. Such interdependence does not automatically indicate unequal power. However, asymmetries may emerge when particular actors exercise greater control over market information, product quality requirements, access to buyers, contractual arrangements, and price determination.

Power within value chains is therefore relational rather than simply determined by the formal position of an actor. Producers may possess production knowledge and control over farm-level activities but have limited influence over downstream commercial decisions. Conversely, processors and intermediaries may exercise greater influence through their access to processing infrastructure, market information, distribution networks, and final consumers. Input suppliers may also influence production costs through their control over the availability and pricing of essential inputs. The resulting distribution of power depends on the availability of alternative trading partners, collective organization, contractual arrangements, and the capacity of individual actors to negotiate commercial relationships.

Kilelu et al. (2017) demonstrate the importance of multi-stakeholder coordination in dairy value-chain development, while Nyokabi et al. (2023) highlight how power relationships, trust, and social networks influence interactions among dairy value-chain actors. These perspectives suggest that value-chain governance should be examined not only in terms of coordination efficiency but also in terms of the distribution of decision-making authority and economic opportunities among participating actors.

2. Market Participation, Economic Inclusion, and Substantive Inclusion

Smallholder inclusion is often discussed in relation to farmers' participation in commercial markets. However, market participation, economic inclusion, and substantive inclusion represent analytically different conditions and should not be treated as interchangeable concepts.

Market participation refers to the extent to which farmers are connected to commercial transactions and organized marketing channels. It includes selling milk to collectors, cooperatives, processors, or direct consumers. This dimension primarily concerns access to and involvement in market exchange. Although market participation is a necessary condition for commercial integration, it does not establish whether farmers receive equitable economic benefits or exercise meaningful influence over market relationships.

Economic inclusion goes beyond participation by considering whether market engagement generates viable and reasonably accessible economic opportunities for smallholders. It concerns farmers' capacity to obtain economic returns, improve production performance, access value-adding activities, and retain benefits from their participation in the value chain. Economic inclusion therefore requires attention to production costs, farm margins, access to finance and inputs, market opportunities, and the distribution of economic benefits. However, improved economic performance does not necessarily indicate that farmers possess greater bargaining power or decision-making authority.

Substantive inclusion represents a deeper condition in which farmers not only participate in markets and obtain economic benefits but also possess meaningful agency within the institutional and commercial arrangements governing the value chain. This includes the capacity to negotiate prices and contractual conditions, participate in collective decision-making, influence organizational governance, access relevant market information, and exercise greater control over the distribution of value and associated risks.

The distinction between economic and social upgrading developed by Barrientos et al. (2011) provides a useful theoretical foundation for this argument. Their framework emphasizes that improvements in economic performance do not automatically generate improvements in social conditions. Applied to dairy goat value chains, this distinction suggests that greater productivity, market access, and value addition should not automatically be interpreted as evidence of substantive smallholder inclusion.

Accordingly, inclusion and subordination are not necessarily mutually exclusive conditions. Farmers may participate in organized markets and obtain positive economic returns while remaining dependent on more powerful actors in relation to input

procurement, pricing, contractual arrangements, or market access. This possibility of simultaneous participation and dependence forms the central analytical concern of the present review.

3. Value Distribution, Producer Autonomy, and Social Sustainability

Value distribution concerns how the economic benefits, production costs, and risks generated within a value chain are allocated among participating actors. It is important to distinguish value creation from value capture. Value creation refers to the generation of additional economic value through production improvements, processing, product differentiation, and marketing activities. Value capture concerns the extent to which individual actors retain or appropriate the benefits generated through these activities.

Within dairy goat value chains, increased milk production or the development of processed products may generate additional economic value. Nevertheless, the distribution of these benefits depends on market access, bargaining arrangements, ownership of processing facilities, transaction costs, and the relative negotiating positions of producers and downstream actors. Farmers who sell raw milk through intermediaries may have fewer opportunities to influence final prices than producers who participate in direct marketing or independent processing. However, direct processing also requires additional investment, labor, technical capabilities, and marketing responsibilities. Consequently, greater producer autonomy does not necessarily translate into higher net benefits under all circumstances.

The distribution of value is therefore closely connected to social sustainability. Janker et al. (2019) conceptualize social sustainability in agriculture through a system-based perspective that considers the needs and rights of actors within agricultural systems, including their interactions and institutional relationships. Their framework emphasizes that the social dimension of agricultural sustainability extends beyond individual farm profitability to include the broader social system in which farming activities are embedded.

Similarly, the Food and Agriculture Organization's (FAO, 2019) sustainable food value-chain framework explicitly considers the distribution of benefits and costs associated with value creation, alongside the inclusion and empowerment of small-scale livestock producers. This perspective is particularly relevant to dairy goat farming because economic opportunities must be assessed together with producers' ability to

maintain livelihoods, participate in organizations, access resources, and benefit from value-chain development.

Social sustainability in this review is therefore understood through the conditions that enable smallholder farmers and their households to maintain viable livelihoods and participate meaningfully in agricultural value chains over time. Relevant dimensions include livelihood security, equitable economic opportunities, producer autonomy, working conditions, institutional participation, and generational continuity. These dimensions connect the distribution of economic benefits to the long-term viability of smallholder farming systems.

4. An Integrated Analytical Framework for Smallholder Inclusion

Building on the preceding theoretical perspectives, this review integrates value-chain governance, power relations, value distribution, and social sustainability into a multidimensional analytical framework. The framework assumes that governance arrangements shape the distribution of power among producers, input suppliers, collectors, processors, cooperatives, and market intermediaries. These power relationships influence access to markets, opportunities for bargaining, participation in decision-making, and the ability of different actors to capture economic value.

The analytical distinction among market participation, economic inclusion, and substantive inclusion provides the basis for assessing the quality of smallholder involvement. Market participation concerns access to commercial transactions, economic inclusion concerns the distribution and viability of economic benefits, and substantive inclusion concerns producers' agency and influence over the institutional and commercial relationships governing the value chain.

For the purpose of this review, substantive inclusion and the potential conditions of subordination are examined through five interrelated dimensions:

1. Bargaining power: farmers' capacity to negotiate prices, contractual conditions, and commercial relationships.
2. Decision-making participation: farmers' influence over cooperative governance, organizational decisions, and value-chain arrangements.
3. Market access: the availability of alternative buyers, marketing channels, and opportunities for direct or collective commercialization.

4. Price-setting autonomy: the extent to which farmers can influence the prices received for their products.
5. Economic benefit distribution: farmers' capacity to retain economic value while managing the costs and risks associated with production and commercialization.

These dimensions are used as qualitative analytical categories for synthesizing evidence across the included studies rather than as standardized quantitative indicators. The framework also recognizes that evidence may differ in strength and availability across dimensions. Consequently, formal market participation is not considered sufficient evidence of substantive inclusion, while structural dependence is interpreted in relation to the specific institutional and commercial conditions documented in each study.

Ultimately, the framework connects the quality of smallholder inclusion to the social sustainability of dairy goat value chains. It provides a basis for examining whether value-chain integration generates not only economic opportunities but also greater producer agency, equitable benefit distribution, and institutional conditions that support the long-term continuity of smallholder livelihoods.

RESEARCH METHODS

1. Review Design

This study employed a Systematic Literature Review (SLR) to synthesize empirical evidence concerning power relations, value distribution, smallholder inclusion, and social sustainability in dairy goat value chains. The review was structured and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Page et al., 2021).

The review focused on three interconnected research questions: (1) How do governance arrangements and power relationships influence smallholder participation in dairy goat value chains? (2) How do market structures, bargaining opportunities, and value-adding activities shape producer autonomy and the distribution of economic benefits? (3) What implications do these relationships have for substantive smallholder inclusion and social sustainability?

A qualitative thematic synthesis was selected to integrate findings from studies employing different research approaches and analytical methods. Rather than estimating pooled effects, the review sought to identify recurring findings, contextual differences, and limitations in the available empirical evidence.

2. Information Sources and Search Strategy

The literature search was conducted using Scopus and Web of Science, two multidisciplinary academic databases covering agricultural sciences, rural development, economics, and related social science disciplines. The search strategy was developed using the Population, Phenomenon of Interest, and Context (PICo) framework. The population comprised dairy goat producers and other relevant actors participating in dairy goat value chains. The phenomenon of interest concerned value-chain governance, power relationships, market participation, economic benefit distribution, and social sustainability. The context encompassed dairy goat production, processing, marketing, and associated institutional relationships.

The search combined three thematic groups of keywords. The first represented dairy goat production ("dairy goat*" OR "goat milk" OR "caprine dairy"); the second represented value-chain relationships ("value chain*" OR "supply chain*" OR "market access" OR "cooperative*" OR "collective action"); and the third represented power relations and social sustainability ("bargaining power" OR "power asymmetr*" OR "value distribution" OR "dependency" OR "social sustainability" OR "empowerment").

Boolean operators, quotation marks, and truncation symbols were used to structure the searches. The complete search expressions, database-specific field restrictions, filters, and search dates are to be reported in Supplementary Table S1 using the original database search histories. The initial searches identified 28 records from Scopus and 24 records from Web of Science, yielding 52 records before deduplication.

3. Eligibility Criteria

Studies were assessed against predefined eligibility criteria intended to maintain consistency with the review objectives. The review considered empirical research published from 2016 onward that addressed dairy goat farming, dairy goat marketing, or relevant dairy goat value-chain relationships.

Studies were considered relevant when they provided empirical evidence concerning at least one of the following: production and economic performance, market participation, cooperative arrangements, value-chain governance, producer autonomy, value addition, bargaining relationships, distribution of economic benefits, or social and institutional sustainability.

Studies focusing on broader small-ruminant production systems were considered only where findings relevant to dairy goats could be identified and interpreted separately or where the dairy goat context was explicitly addressed.

Publications were excluded when they were published before 2016; consisted of review articles or book chapters; lacked empirical findings; or did not provide relevant evidence concerning dairy goat production, value-chain organization, or associated economic and institutional relationships.

The application of these criteria to individual records, including any additional restrictions regarding document type, language, and full-text accessibility, must be confirmed against the original screening records before finalizing the review.

4. Study Selection and PRISMA Flow

The identification and selection of studies followed the stages specified in PRISMA 2020: identification, removal of duplicate records, title and abstract screening, report retrieval, full-text eligibility assessment, and final inclusion.

The initial database search identified 52 records, comprising 28 articles from Scopus and 24 from Web of Science. After removing 18 duplicate records, 34 articles remained for title and abstract screening. The screening process excluded articles published before 2016 (n = 8), book chapters (n = 1), review articles (n = 3), and studies with irrelevant titles or abstracts (n = 12). Following screening, 11 articles were reported as eligible for full-text retrieval. Of these, four could not be accessed, leaving seven articles for full-text eligibility assessment. No additional articles were excluded at this stage, resulting in seven studies included in the final review. The identification, screening, eligibility assessment, and inclusion processes are presented in Figure 1.

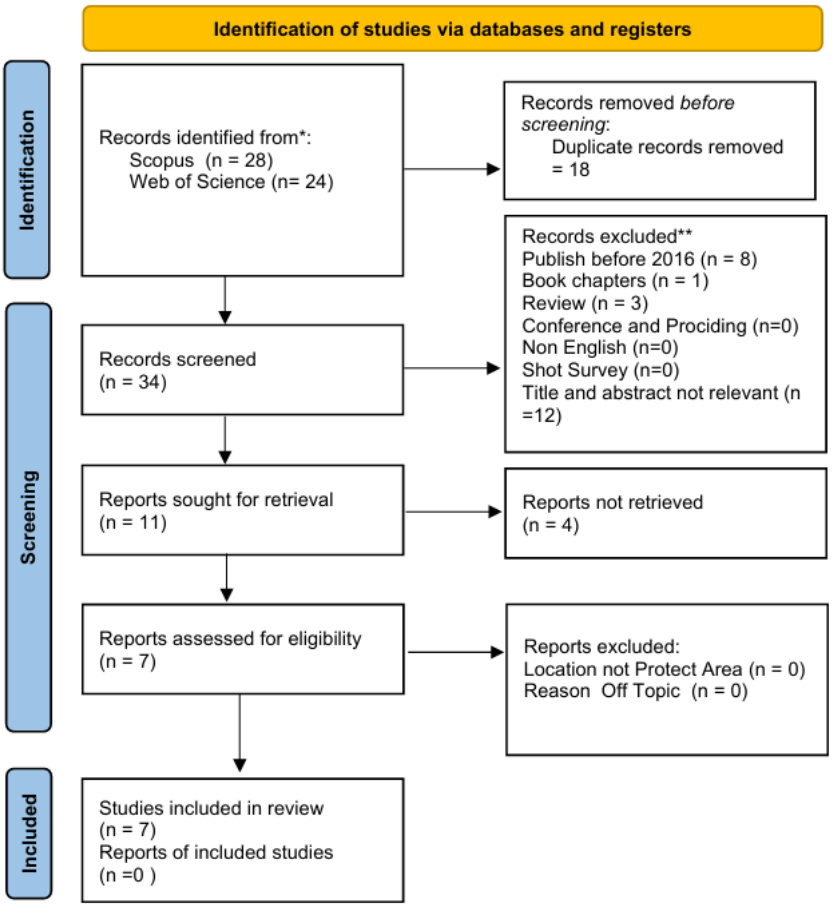


Figure 1. Prisma Flow

5. Data Extraction and Methodological Quality Appraisal

Data extraction was organized using a structured evidence-extraction framework designed to capture study characteristics, production and market arrangements, empirical findings, and their relevance to smallholder inclusion and social sustainability. The extraction framework comprised bibliographic information (authors, publication year, and study location); study characteristics (objectives, research design, sample, and analytical methods); livestock and production-system characteristics; market organization and governance arrangements; production and economic outcomes; evidence concerning producer autonomy and value capture; institutional and social sustainability conditions; and the principal findings and limitations of each study.

To maintain conceptual consistency, findings concerning smallholder inclusion were organized around five analytical dimensions: bargaining power, decision-making participation, market access, price-setting autonomy, and economic benefit distribution.

Evidence directly reported by the original studies was distinguished from interpretations developed during the review. Where an analytical dimension was not examined or reported in a study, the corresponding evidence was identified as unavailable rather than treated as evidence of the absence of that condition.

The methodological quality of the included studies should be assessed using a design-appropriate critical appraisal framework. Given the diversity of qualitative, quantitative, and mixed-methods approaches represented in the review, the Mixed Methods Appraisal Tool (MMAT), version 2018, is proposed for this assessment (Hong et al., 2018). The MMAT assessment should examine the appropriateness of each study's design, sampling and data collection procedures, methodological rigor, and the coherence between findings and supporting evidence, applying the criteria corresponding to each study design.

The appraisal results and their implications for interpreting the evidence will be reported in Supplementary Table S2. The review must distinguish conclusions supported by methodologically robust evidence from those based on studies with important limitations.

Table 1. Thematic Synthesis of the Included Studies

Main theme	Supporting studies	Key findings	Implications
Production efficiency and economic performance	García & Pérez (2023), Papadopoulou et al (2024), Sánchez & Delgado (2025) Morales et al (2022), Lizarralde et al (2026)	Efficiency depends on management and input costs; processing and diversification provide additional economic opportunities	Production intensification alone is insufficient to ensure economic sustainability
Value-chain governance and market integration	García & Pérez (2023), Ruiz-Morales et al (2024), Morales et al (2022), Lizarralde et al (2026)	Cooperative marketing provides coordination and income stability, while short chains can strengthen producer autonomy	Governance arrangements shape the benefits of market participation
Power relations and value distribution	García & Pérez (2023), Ruiz-Morales et al (2024), Sánchez & Delgado(2025), Morales et al (2022), Lizarralde et al (2026)	Dependence on external inputs may constrain autonomy; direct processing increases opportunities for value capture	Market access does not necessarily guarantee substantive inclusion
Institutional participation and collective action	Menezes & Silva (2023), Ruiz-Morales et al (2024), Morales et al (2022)	Collaborative networks and cooperative organization support participation and coordination	Institutional inclusion needs to be assessed beyond formal membership
Social sustainability and rural livelihoods	Menezesb& Silva (2023) Papadopoulou et al (2024) Ruiz-Morales et al (2024) Sánchez & Delgado (2025) Morales et al (2022) Lizarralde et al (2026)	Generational renewal, labor shortages, regulation, and environmental pressures threaten continuity	Economic, social, and institutional dimensions should be considered together

Source: Thematic synthesis based on the seven-study extraction table supplied for this review.

6. Data Synthesis and Analytical Framework

A qualitative thematic synthesis was used to organize and interpret the findings across the included studies. The synthesis focused on relationships among farming-system characteristics, economic performance, governance arrangements, producer autonomy, value distribution, and social sustainability. The analytical framework distinguished three levels of smallholder involvement: market participation, economic inclusion, and substantive inclusion. Market participation refers to farmers' involvement in commercial exchange; economic inclusion concerns their opportunities to obtain and retain economic benefits; and substantive inclusion encompasses meaningful influence over commercial and institutional relationships.

The five dimensions of bargaining power, decision-making participation, market access, price-setting autonomy, and economic benefit distribution provided the conceptual basis for examining evidence of inclusion and potential subordination. Findings were interpreted by considering the research design, study context, methodological quality, and specificity of evidence supporting each theme. Particular attention was given to distinguishing observed economic and institutional conditions from broader theoretical interpretations concerning structural dependence and social sustainability. Due to the heterogeneity of study designs, production systems, outcome measures, and geographical contexts, statistical meta-analysis was not considered appropriate. The synthesis therefore emphasized qualitative comparisons, convergent and divergent findings, and identification of research gaps.

7. Scope and Limitations of the Evidence Base

The review's conclusions should be interpreted in light of the limited number of included studies and their geographical and methodological characteristics. The evidence base reported in the original manuscript comprises seven studies, predominantly located in Spain and the broader Mediterranean context. However, both the final included-study count and the characteristics of each study require confirmation through the screening audit.

The relatively small and geographically concentrated evidence base limits the transferability of the findings to dairy goat value chains operating under different economic, institutional, and regulatory conditions. Moreover, the available studies differ in their primary research objectives, and several do not directly measure bargaining power, decision-making authority, or the distribution of economic benefits among value-chain actors. Consequently, the review is intended to provide a context-sensitive synthesis of the available evidence and to develop a conceptual framework for further investigation, rather than to establish universal causal relationships or generalizable estimates of producer subordination.

RESULTS AND DISCUSSION

The review included seven studies examining production efficiency, economic performance, value-chain governance, and social sustainability in dairy goat and related small-ruminant farming systems. Most were conducted in Spain and the Mediterranean

region, employing quantitative, qualitative, mixed-methods, and efficiency-based approaches. The studies covered pastoral, semi-intensive, intensive, cooperative-based, and artisanal production systems. Morales-Jerrett et al. (2022) analyzed 21 dairy goat farms using DEA and SWOT analysis, while Lizarralde et al. (2026) examined farming systems through 160 surveys and 23 interviews. Three interconnected themes emerged: production efficiency, value-chain relationships, and the institutional conditions shaping smallholder inclusion and sustainability.

The reviewed evidence indicates that production intensification does not necessarily improve profitability. Morales-Jerrett et al. (2022) identified differences in cost structures among farming systems, with feed expenditure representing a major production cost and no significant difference in net margins between certain pastoral and intensive systems. Similarly, diversified production, improved resource management, and artisanal processing were associated with opportunities for greater economic returns. These findings suggest that technical efficiency and economic sustainability are distinct but interconnected. While efficiency improves resource utilization, profitability also depends on input costs, product differentiation, market access, and value capture. Therefore, improving production efficiency alone may be insufficient to strengthen smallholder economic sustainability.

Value-chain governance influences smallholders' market participation and economic autonomy. Cooperative marketing can improve income stability, strengthen coordination, and reduce dependence on informal intermediaries. However, cooperative membership does not necessarily guarantee equal bargaining power or decision-making authority. Alternatively, short supply chains, direct sales, and artisanal processing may provide greater pricing autonomy and opportunities for value capture. Lizarralde et al. (2026) highlighted differences between intensive systems dependent on external suppliers and diversified or artisanal systems offering greater marketing flexibility. Thus, the benefits of value-chain integration depend on governance arrangements, producer participation, and control over economic decisions rather than market access alone.

Smallholder participation in dairy goat value chains does not automatically ensure equitable benefit distribution. Dependence on purchased inputs, limited marketing alternatives, and weak influence over prices may reinforce unequal economic relationships. Cooperative arrangements can reduce certain market risks, while

independent processing and direct sales may strengthen producer autonomy. Nevertheless, greater autonomy may involve additional labor, investment, and managerial responsibilities. These findings distinguish market participation from substantive inclusion, which requires meaningful influence over decisions and access to economic benefits. Consequently, inclusion and subordination may coexist within the same value chain, depending on how bargaining power, responsibilities, and economic returns are distributed.

Social sustainability extends beyond profitability to include labor conditions, institutional continuity, generational renewal, and rural livelihood resilience. Morales-Jerrett et al. (2022) and Lizarralde et al. (2026) identified farmer aging, succession difficulties, and shortages of skilled rural labor as important challenges. Additional pressures include work-related exhaustion, regulatory complexity, dependence on institutional support, and environmental constraints. Although product diversification may improve economic autonomy, it can also increase labor demands. These findings emphasize that stable income and improved productivity alone cannot guarantee long-term sustainability without supportive institutions, viable working conditions, and opportunities for younger generations.

The synthesis identifies four interconnected pathways toward sustainable smallholder inclusion: improving resource-use efficiency, strengthening collective market organization, expanding value-added activities, and enhancing institutional support. Efficient production management can improve economic performance without necessarily increasing production intensity. Cooperatives may strengthen market stability, provided producers have meaningful decision-making opportunities. Direct marketing and processing can increase value capture but require additional resources and capabilities. Meanwhile, institutional support must address labor constraints, regulatory burdens, and generational challenges. Collectively, these pathways suggest that substantive inclusion depends on the quality of economic relationships, governance arrangements, and producers' ability to retain benefits and exercise autonomy.

Several research gaps remain. First, existing studies emphasize efficiency, profitability, and market participation, while directly measuring bargaining power, power asymmetry, and value distribution less extensively. Second, evidence remains limited regarding how cooperative and value-adding benefits are distributed among producers

with different resources and capabilities. Third, the relationships between economic performance, household welfare, gender, labor conditions, and institutional resilience require further investigation. Finally, the geographical concentration of studies in Spain and the Mediterranean limits their transferability to other production and market contexts. Future research should therefore examine not only whether smallholders participate in value chains, but also how participation is governed, who controls value creation, and how economic and social benefits are distributed.

CONCLUSION

This systematic review highlights the complex relationship between power relations, value distribution, and social sustainability in dairy goat value chains. Evidence from seven studies indicates that smallholder inclusion depends not only on market participation but also on producers' bargaining power, organizational arrangements, and ability to capture economic value. Cooperative marketing contributes to income stability and market coordination, while short supply chains and independent processing offer greater pricing autonomy and opportunities for value addition. However, dependence on external inputs, unequal market relationships, and limited institutional capacity may constrain these benefits. Furthermore, aging farmers, labor shortages, regulatory burdens, and environmental pressures threaten long-term sustainability. These findings suggest that market integration alone does not guarantee equitable inclusion. Sustainable dairy goat value chains require governance arrangements that strengthen producer autonomy, support fairer value distribution, and improve institutional resilience. Future research should examine how these mechanisms operate across diverse geographical and institutional contexts.

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external inputs, unequal market relationships, and limited institutional capacity may constrain these benefits. Furthermore, aging farmers, labor shortages, regulatory burdens, and environmental pressures threaten long-term sustainability. These findings suggest that market integration alone does not guarantee equitable inclusion. Sustainable dairy goat value chains require governance arrangements that strengthen producer autonomy, support fairer value distribution, and improve institutional resilience. Future research should examine how these mechanisms operate across diverse geographical and institutional contexts.

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