

Review

Smallholder Market Integration Under Political Constraints: An Integrative Review of Governance, Transaction Costs, and Resilience in Sustainable Agri-Food Value Chains

Ihab Hafeth Mujahed * and Faten Khamassi 

Institut National Agronomique de Tunisie (INAT), Université de Carthage, 43 Avenue Charles Nicolle, 1082 Tunis, Tunisia; faten.khamassi@gmail.com

* Correspondence: mujahidihab@gmail.com

Abstract

Sustainable agri-food value chains depend on the capacity of smallholders to participate in markets in stable, remunerative and upgrade-oriented ways, yet in conflict-affected and politically constrained settings this capacity is weakened by mobility restrictions, insecure logistics, payment disruption, volatile inputs, thin market information and uncertain enforcement. This study aims to explain how such constraints reshape smallholder market integration and under what conditions governance and institutional arrangements stabilize, rather than reproduce, market exclusion. An integrative review was conducted following established methodological guidance. A structured search of Scopus, Web of Science and Google Scholar, extended by citation tracing, returned 821 records; after de-duplication and two-stage screening against explicit eligibility criteria, 44 studies were retained, of which 35 empirical studies form the evidence corpus. Each study was coded with a five-field extraction matrix across seven diagnostic dimensions—inputs and supplies, production capacity and technology, end-markets and trade, value-chain governance, sustainable production and energy use, value-chain finance, and the business and socio-political environment—and appraised for methodological quality with the Mixed Methods Appraisal Tool, so that heterogeneous designs were weighted rather than treated as equivalent. The synthesis shows that the most binding constraints are transactional and institutional rather than purely technical, and that governance operates as a conditional bridge: cooperatives, contracting, trader coordination, market-support institutions and public enabling arrangements lower transaction costs and stabilize exchange only where transparency, credible enforcement, fair risk-sharing and protection against opportunism are present; where these are absent, the same arrangements shift risk onto farmers. The review derives a measurement-focused, equity-sensitive research agenda for resilient and sustainable value-chain integration under constraints.



Academic Editors: Marius Constantin, Raluca Ignat and Donatella Privitera

Received: 3 June 2026

Revised: 28 June 2026

Accepted: 1 July 2026

Published: 9 July 2026

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Keywords: smallholder market integration; agricultural value chains; political constraint; value-chain governance; transaction costs; sustainable food systems; integrative review

1. Introduction

Agri-food systems in low- and middle-income countries have undergone a marked restructuring. The growth of processors, traders, logistics firms, retailers and service providers has moved value creation beyond the farm gate and has made coordination, quality differentiation and service bundles central to market access [1]. For smallholders,

this transformation means that market integration cannot be reduced to whether a farmer sells output at least once. A more useful understanding asks whether the farmer can engage markets in a sustained, remunerative and upgrade-oriented manner: whether sales relationships are credible, whether inputs and information arrive on time, whether product quality can be rewarded, and whether participation generates incentives for further investment. Because the reliability of these relationships ultimately determines whether food systems are inclusive, resilient and environmentally sustainable, this is also a sustainability question, bearing directly on the Sustainable Development Goals concerned with poverty, hunger, gender equality, decent work, reduced inequality and responsible production (SDGs 1, 2, 5, 8, 10 and 12) [2].

This distinction matters for both development and sustainability. Value-chain participation can support income growth when it changes production decisions, marketing behavior and household investment rather than merely shifting the point of sale [3]. At the same time, the benefits of value-chain development are not uniform. Evidence from Nepal shows that agricultural value-chain interventions can raise agricultural income and reshape marketing behavior, but the distribution of gains can differ across social groups [3,4]. Similarly, value-chain inclusiveness can improve resilience to shocks when coordination arrangements provide predictable outlets and support services, as shown in Zambia's sugar belt [5]. However, recent multi-country evidence from Burkina Faso, Mozambique and Cote d'Ivoire cautions against assuming a simple value-chain participation to nutrition pathway, particularly where power relations and gendered risks are insufficiently addressed [6].

Conflict-affected and politically constrained environments make this problem sharper. Farmers may possess productive potential, yet the feasibility of market engagement is shaped by constraints that destabilize the basic functions of exchange. Mobility limitations, disrupted banking, unreliable fuel and electricity, uncertain information, and weak enforcement can raise transaction costs, reduce market predictability and discourage quality upgrading. In Myanmar, for example, post-coup disruptions to banking and transport increased distribution margins and price dispersion in the rice value chain [7]. Broader evidence from Myanmar's agrifood value chains shows that disruption travels across farmers, input retailers, traders, millers and vendors, affecting both farm and consumer prices [8].

Political constraint also changes bargaining power. When farmers depend on a restricted number of intermediaries who themselves face high risk, information asymmetry and opportunistic grading or delayed payments can become more likely. This is especially important because high physical and institutional transaction costs limit the intensity and quality of market participation, while collective action may improve welfare only if it avoids weak governance and elite capture [9]. Collaboration in agricultural value chains, whether vertical, horizontal or network-based, can improve participation when it is supported by reliable public and non-public actors [10]. Yet such collaboration is particularly difficult where distance is administrative, political and infrastructural as well as geographical [11].

This review therefore asks two connected questions. First, what constraints most consistently weaken smallholder market integration in conflict-affected and politically constrained agricultural value chains? Second, under what conditions do governance and institutional arrangements help stabilize market integration rather than simply moving risk onto smallholders? The paper answers these questions through an integrative review, bringing together evidence from market access studies, value-chain analysis, New Institutional Economics and recent empirical work on fragile and constrained food systems. The contribution is threefold. It provides a seven-dimension diagnostic synthesis of market-integration bottlenecks, develops a governance-centered interpretation of why

bridging arrangements work or fail under constraint, and clarifies how market integration is measured across household, value-chain and market-system levels.

The review is framed by three complementary bodies of theory—value-chain analysis, market-access theory and New Institutional Economics—and is conducted as an integrative review following the five-stage logic of problem identification, literature search, data evaluation, data analysis and presentation [12]. The aim is diagnostic and explanatory rather than exhaustive: to map where political constraint is transmitted across the chain and to identify the conditions under which governance stabilizes integration. Evidence was collected through a structured search of Scopus, Web of Science and Google Scholar, screened against explicit eligibility criteria, appraised for methodological quality, and coded across seven diagnostic dimensions, with the full audit trail reported in Section 2 and Appendix A so that the synthesis is transparent and reproducible in its logic [13–15]. The gap the review addresses is that existing studies typically examine single constraints or single nodes in isolation, leaving unexplained how political restriction and institutional arrangements jointly reshape integration across the whole chain. The synthesis shows that governance operates as a conditional bridge whose benefits depend on transparency, credible enforcement, fair risk-sharing and protection against opportunism. Equity and gender are treated as cross-cutting conditions of integration rather than a separate node, and the analysis is positioned against the Sustainable Development Goals most exposed to value-chain reliability (SDGs 1, 2, 5, 8, 10 and 12) [2,16,17].

The article is intentionally positioned for the sustainability of agri-food value chains. In this framing, sustainability is not limited to environmental performance. It also concerns the reliability, inclusiveness and resilience of the chain relationships through which food, money, information and risk move. A value chain that cannot sustain credible exchange under predictable political stress is unlikely to support long-term investment in product quality, resource use, value addition or food-system resilience.

2. Materials and Methods

2.1. Review Design and Scope

The paper uses an integrative review design. It is not presented as a systematic review or meta-analysis, because the relevant evidence is dispersed across agricultural economics, food policy, development studies, value-chain analysis, institutional economics and conflict studies. The purpose is therefore conceptual and diagnostic rather than exhaustive: to synthesize mechanisms, map recurring constraints and identify governance conditions that appear to shape integration outcomes under high transaction costs and weak enforcement. This choice is appropriate where studies use different units of analysis, ranging from household commercialization and channel choice to spatial price transmission, value-chain margins, adoption and resilience.

The review focuses on smallholder farmers and small-scale producers, while recognizing that smallholders are heterogeneous in land size, assets, market orientation, risk exposure and adaptive capacity. The setting of interest is conflict-affected or politically constrained environments. This includes cases where insecurity, occupation, mobility restrictions, sanctions, regulatory uncertainty, institutional weakness, finance disruption, transport risk or enforcement limitations materially affect value-chain functions. The unit of analysis is the agricultural value chain, including inputs, production, aggregation, storage, processing, logistics, wholesale, retail and market-support functions.

An integrative design is adopted in preference to a systematic review or meta-analysis for three reasons. First, the relevant evidence is methodologically heterogeneous—combining household econometrics, spatial price-transmission models, satellite analyses, case studies and qualitative work—and the integrative method is the approach explicitly

designed to combine diverse empirical and theoretical sources within a single synthesis [12,13]. Second, the review's purpose is theory-oriented: it seeks to assess, critique and reconceptualize how governance mediates integration under constraint, which is the task for which integrative reviews are best suited [13,18]. Third, the qualifying evidence is too dispersed and too varied in design to support the statistical pooling that a systematic review or meta-analysis would require. The review nonetheless follows the disciplined five-stage sequence of problem identification, literature search, data evaluation, data analysis and presentation, and documents each stage explicitly so that the absence of meta-analysis is not an absence of method [12,19].

2.2. Search Strategy and Eligibility Criteria

The search was conducted through Scopus, Web of Science and Google Scholar using four keyword blocks: (i) smallholder OR small-scale farmer; (ii) market integration OR market participation OR market access OR commercialization; (iii) value chain OR supply chain OR agrifood chain; and (iv) conflict OR fragility OR political constraint OR occupation OR governance OR institutions OR cooperative OR contract OR coordination. Backward and forward citation tracing was used for cornerstone papers on market participation, value-chain transformation, contract farming, collective action and spatial market integration. Institutional web sources were consulted only to clarify terminology and identify leads; the synthesis itself is based on peer-reviewed journal articles. The keyword blocks were derived from cornerstone works on market participation, contract farming and value-chain governance [20–24], and the search and its reporting follow PRISMA 2020 guidance adapted to an integrative review [14].

Articles were eligible when they addressed smallholder market integration or a closely related proxy and examined at least one barrier, enabling condition, governance arrangement or institutional factor relevant to market participation. Studies were included if they reported empirical evidence, conceptual frameworks or review-based findings that helped explain mechanisms across value-chain nodes. Articles were excluded when they were purely macro trade analyses without a smallholder or value-chain mechanism, non-peer-reviewed opinion pieces, project reports without journal publication, or papers that discussed conflict or food security without an identifiable pathway to market integration.

Table 1 sets out the operational boundaries of the search, the eligibility rules applied at screening, and the role that each decision plays in the synthesis.

Table 1. Search strategy, boundaries and eligibility rules used in the integrative review.

Review Element	Operational Decision	Purpose in the Synthesis
Population	Smallholder and small-scale farmers, as defined by each study.	Avoids imposing a single farm-size threshold across heterogeneous regions.
Setting	Conflict-affected, fragile or politically constrained environments; comparable high-risk settings were included when they clarified mechanisms.	Captures insecurity, occupation, mobility limits, sanctions, banking disruption, enforcement weakness and policy uncertainty.
Value-chain unit	Inputs, production, aggregation, processing, logistics, finance, end markets and support institutions.	Prevents the review from treating market access as a farm-gate issue only.
Integration outcomes	Commercialization intensity, channel choice, sustained participation, price transmission, margins, transaction costs, quality compliance and upgrading.	Allows comparison across household, chain and market-system evidence.

Table 1. *Cont.*

Review Element	Operational Decision	Purpose in the Synthesis
Inclusion criteria	Peer-reviewed studies addressing market integration or close proxies and at least one barrier, enabler, governance arrangement or institutional condition.	Focuses the synthesis on mechanisms that can inform sustainable value-chain design.
Exclusion criteria	Macro trade studies without a smallholder mechanism; non-peer-reviewed reports; opinion pieces; studies without value-chain relevance.	Improves conceptual coherence while recognizing that this is not a systematic review.

Note: Operational criteria were defined by the authors for this review, drawing on integrative-review guidance [12,13] and on cornerstone studies of smallholder market participation and value-chain governance [20,22–24]. Source: authors' elaboration.

2.3. Study Selection and Search Outcomes

The database searches returned 780 records (Scopus = 312; Web of Science = 268; Google Scholar, restricted to the first 200 ranked results = 200), and backward and forward citation tracing of cornerstone papers added 41 further records, giving 821 records in total. After 233 duplicates were removed, 588 unique records were screened on title and abstract, of which 470 were excluded as clearly outside scope. The remaining 118 records were retrieved and assessed in full text. At this stage 74 records were excluded: 23 contained no identifiable smallholder or value-chain mechanism, 14 were macro trade analyses with no smallholder linkage, 19 were non-peer-reviewed reports, opinion pieces or preprints, 13 addressed conflict or food security without an identifiable pathway to market integration, and 5 could not be retrieved in full text or in an accessible language. Forty-four studies met all eligibility criteria and were retained for synthesis. The selection process is summarized in Figure 1.

The retained studies are distinguished by function so that the evidence base of the synthesis can be told apart from works cited only to frame the argument. Thirty-five empirical studies constitute the evidence corpus that is synthesized across the seven diagnostic dimensions; the remaining nine retained works are theoretical or methodological and provide the analytical scaffolding. To keep the synthesis verifiable, the empirical corpus is reported in two complementary ways: Table 2 maps a representative subset of nine studies, and the coded corpus—with extraction fields, study design and quality ratings—is provided in Appendix A (Table A1).

Table 2. Study-by-study evidence map linking chain nodes, constraint types and integration measures.

Study	Setting	Chain/Commodity	Primary Node(s)	Constraint Type	Outcome Measure(s)
[7]	Myanmar	Rice	Farm → milling → retail	Post-coup transport and banking constraints	Distribution margins, retail prices, spatial price dispersion
[8]	Myanmar	Multiple agrifood chains	Farmers, input retailers, traders, millers, vendors	Banking, transport, fuel, electricity and connectivity disruptions	Input prices, farm sales prices, retail food prices, dietary cost estimates
[25]	Myanmar	Fertilizer	Input supply and on-farm use	Violent conflict intensity	Fertilizer prices, adoption, intensity and efficiency

Table 2. *Cont.*

Study	Setting	Chain/Commodity	Primary Node(s)	Constraint Type	Outcome Measure(s)
[26]	Sudan	Wheat and sorghum	Markets and trade	Fragility, sanctions, conflict and macro instability	Spatial market integration through price cointegration and adjustment
[27]	Somalia	Rice, maize and sorghum	Markets and trade	Conflict as transaction cost shock	Speed of price transmission across markets
[28]	West Bank	Mixed crop technologies	Production and extension	Occupation-related land and movement constraints	Adoption of improved varieties, fertilizers, pesticides and biological control
[29]	Afghanistan	Wheat program context	Production and development delivery	Fragile and conflict-affected program dynamics	NDVI-based yield trends and spillover patterns
[30]	Nigeria	Land rental market	Enabling environment	Violent conflict shocks	Land rental sizes and values; moderating institutional factors
[31]	West Bank	Olives	Collective action and production	Geopolitical constraint	Technical efficiency, total factor productivity and cooperative effects

2.4. Data Extraction, Coding and Quality Appraisal

Eligible studies were coded using an extraction matrix with five fields: context characteristics, chain nodes, constraint type, governance or institutional arrangement, and integration outcome or proxy. The coding was then organized into seven diagnostic dimensions: inputs and supplies; production capacity and technology; end-markets and trade; governance of value chains; sustainable production and energy use; value chain finance; and business environment and socio-political context. These dimensions were selected because they cover the main functional sites where political constraints can amplify transaction costs and weaken integration. The completed extraction matrix for the empirical corpus is presented in Appendix A (Table A1), so that the coding is open to inspection rather than only described.

The synthesis proceeded in two stages. First, recurring patterns and contradictions were consolidated within each diagnostic dimension. Second, cross-cutting interpretation was used to identify how governance and institutions mediate integration under high risk. Special attention was given to whether arrangements reduce transaction costs, stabilize information and payments, support upgrading, distribute risk fairly and remain credible when formal enforcement is weak. The review was not preregistered and does not claim comprehensive coverage of all relevant studies; instead, it provides a transparent, conceptually structured synthesis designed to be replicable in its logic and cautious in its claims. To make the second stage genuinely cross-study rather than a sequence of summaries, findings within each dimension were compared to identify convergences, divergences and boundary conditions, and the dimension-level patterns were then read against one another to derive the interpretation developed in Section 4; disconfirming cases—arrangements that did not improve integration under constraint—were sought deliberately and are reported alongside confirming evidence.

Methodological quality was appraised with the Mixed Methods Appraisal Tool (MMAT, version 2018), which provides comparable criteria across qualitative, quantitative descriptive, quantitative non-randomized and mixed-methods designs [15]. Each

empirical study was rated against the five MMAT criteria appropriate to its design, and the ratings are recorded in Appendix A. Most studies met four or five criteria, a minority met three, and weaker studies were retained but given correspondingly less interpretive weight. As a result, sources of very different designs—for example a satellite analysis of cropland, a household survey and a spatial price-transmission model—are weighted by appraised quality rather than treated as equivalent.

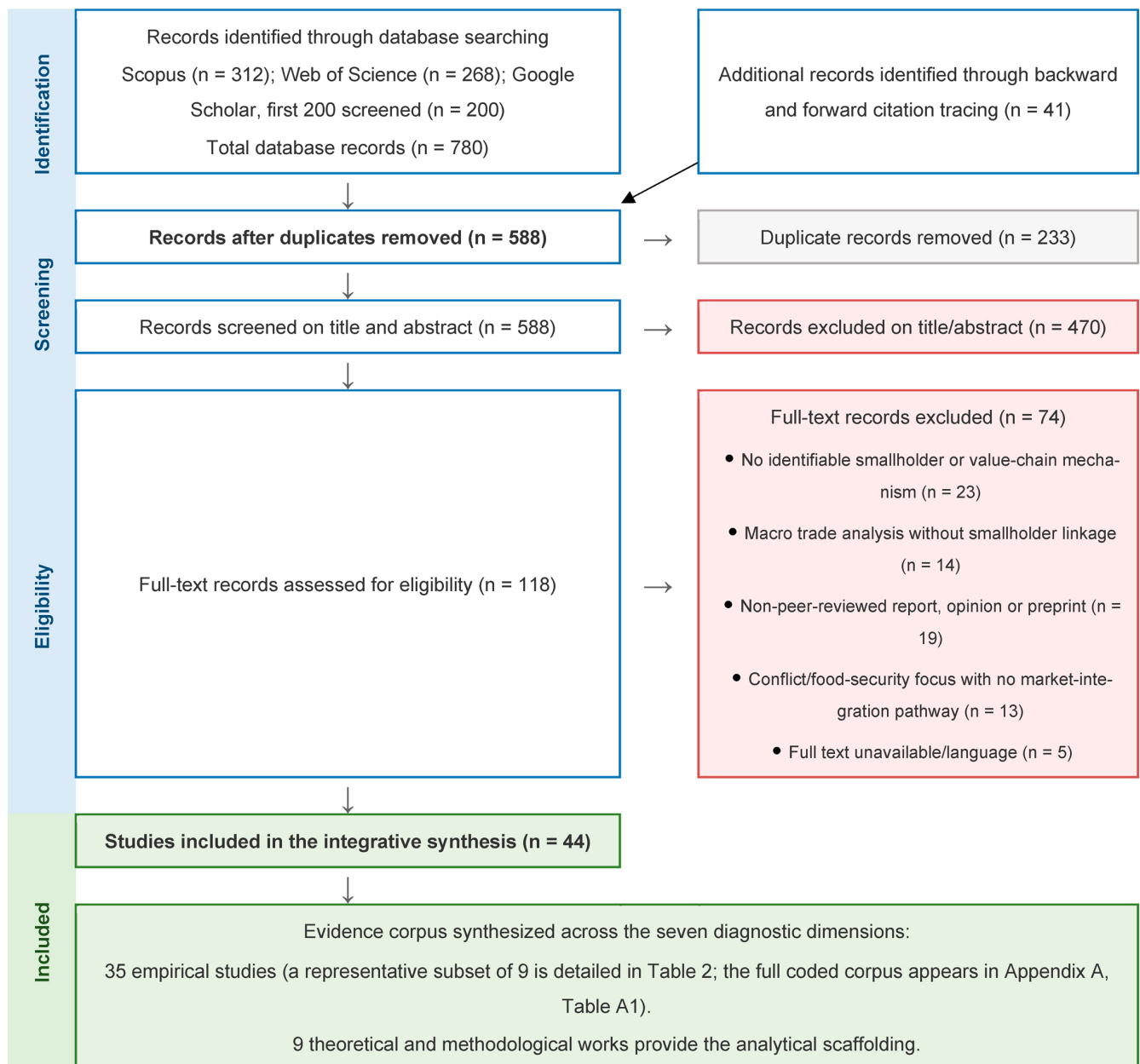


Figure 1. Study identification, screening and selection flow for the integrative review.

2.5. Analytical Framework

The analytical framework combines value-chain theory, market access theory and New Institutional Economics (NIE). Value-chain theory maps where value is created, captured or lost across actors and nodes. Market access theory explains how transport, information, search, bargaining and payment costs influence participation intensity and channel choice. NIE adds the governance and enforcement layer, explaining why contracts, cooperatives, relational agreements and public–private arrangements appear when spot markets are too

risky and full vertical integration is infeasible. Figure 2 expresses the resulting causal logic rather than a static list of factors.

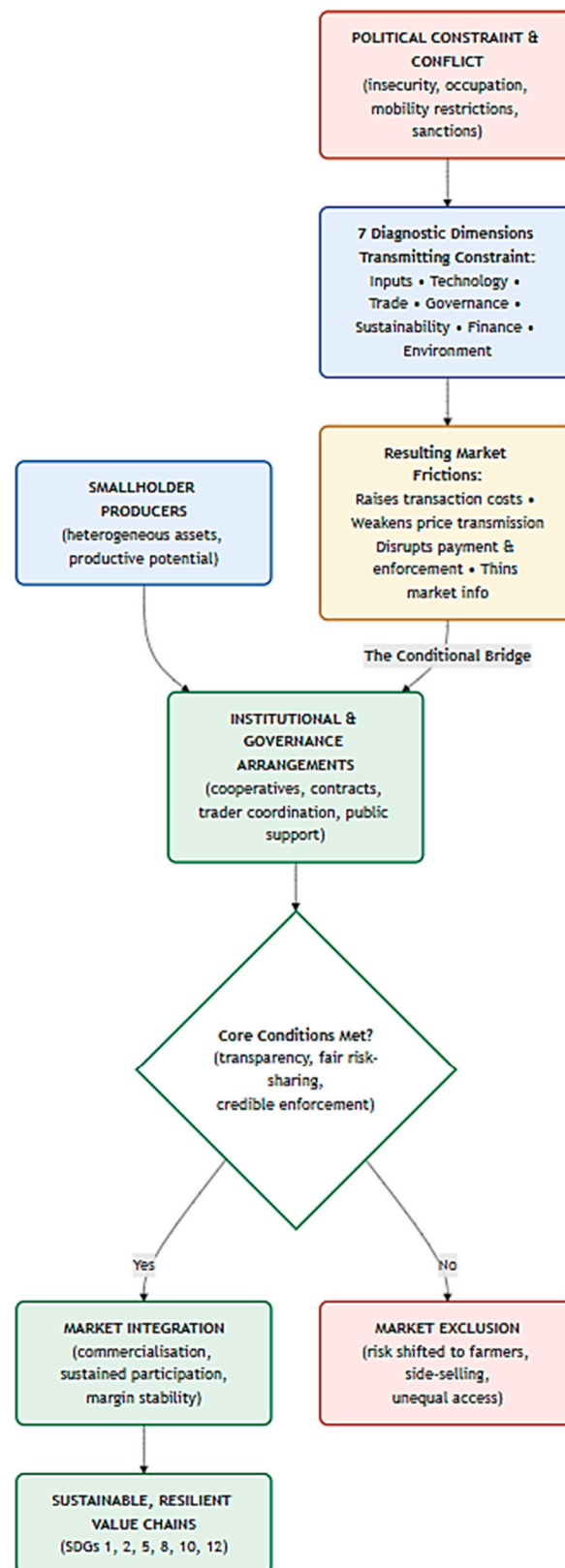


Figure 2. Analytical framework: governance and institutions as a conditional bridge for smallholder market integration under political constraint.

Within this framework, smallholder market integration is defined not as the act of selling but as the extent to which farmers are connected to output markets and chain relationships in ways that shape production, marketing and upgrading decisions [20,21,32,33]. Farmers may sell surplus at the farm gate and still remain weakly integrated if sales are occasional, prices are opaque, quality premia are not credible, or buyers do not provide stable demand. Three studies inform this definition: market participation and commercialization, in which fixed and proportional barriers can keep farmers below a profitable participation threshold [20,21]; sustained participation in modern or high-value markets, where quality, reliability, traceability and timely payment are part of the relationship rather than optional extras [32,33]; and the governance view, in which exchange must be organized and protected when quality is hard to observe, enforcement is costly and opportunism is possible [22,23]. NIE explains why hybrid arrangements—contracts, cooperatives, relational agreements and coordinated service packages—emerge between pure spot markets and full hierarchy when uncertainty, asset specificity, measurement problems and enforcement costs are high [34,35]. Figure 2 brings these elements together: political constraint is transmitted through the seven diagnostic dimensions, raising transaction costs and weakening exchange; governance and institutional arrangements can then bridge smallholders to markets, but only conditionally, producing market integration—commercialization intensity, channel choice, sustained participation, and price transmission and margin stability—when transparency, credible enforcement, fair risk-sharing and protection against opportunism are present, and market exclusion when they are not.

3. Results: Diagnostic Synthesis Across Value-Chain Dimensions

Table 2 presents an evidence map linking selected studies to value-chain nodes, constraint types and integration measures. The purpose is not to rank studies, but to show the diversity of empirical windows through which integration under constraint has been examined.

The mapped studies span satellite, household-survey, econometric and case-study designs and cover settings as different as Myanmar, Sudan, Somalia, the West Bank, Afghanistan and Nigeria; the table is illustrative of this diversity rather than exhaustive, and the full coded corpus with study design and quality ratings is provided in Appendix A (Table A1). Because the designs differ so widely, their findings are weighted by appraised quality rather than treated as equivalent, so that a price-transmission model, a satellite analysis and a household survey each inform the synthesis in proportion to what their design can support.

Before turning to the dimensions individually, one cross-cutting observation should be noted. Constrained value chains usually retain their actors—farmers produce, traders aggregate, processors operate and consumers buy—but the links among them weaken: payments become less predictable, routes costlier, energy uncertain and information localized, so the effective market shrinks even when nominal demand persists [7,8,36]. The seven diagnostic dimensions below should therefore be read as interacting sites within a single chain rather than as independent silos, and the weak link is frequently the coordination infrastructure that moves products, money and information rather than production itself.

3.1. Inputs and Supplies

Input systems in constrained environments are exposed to import restrictions, transport risk, price volatility, retail disruption and payment uncertainty. Fertilizer evidence from Myanmar shows that conflict intensity is associated with higher fertilizer prices, lower use at both extensive and intensive margins, and reduced fertilizer-use efficiency [25]. Multi-node agrifood evidence from the same context confirms that input retailers face

operational disruptions similar to farmers and traders, contributing to unstable production conditions [8].

Input constraints are also informational and institutional. Even when inputs are physically available, farmers may not use them efficiently without extension, reliable advice or confidence that output markets will reward the investment. In the West Bank, extension is associated with the adoption of improved varieties, fertilizers, pesticides and biological control despite occupation-related constraints [28]. Evidence from Palestinian olive farms also suggests that cooperative membership can improve efficiency and productivity, partly by pooling services and reducing information and procurement costs [31].

Governance matters most where input constraints are bundled with liquidity constraints. Resource-providing contracts in Ghanaian oil palm production improved input use and yields more than marketing contracts because they bundled inputs, services and credit [37]. Value-chain finance research reaches a similar conclusion: effective financial systems are embedded in transaction records, service bundles and value-chain relationships rather than isolated credit products [38]. Under political constraint, such bundles can be useful, but only if farmers regard pricing, grading and repayment terms as transparent and enforceable [33].

3.2. Production Capacity and Technology

Production capacity under conflict is shaped by lower input use, labor disruption, land insecurity, service interruptions and post-harvest risk. Satellite-based evidence from Syria shows that civil war increased spatial and interannual variation in productive cropland, indicating that conflict alters land use and productive stability well beyond farm management choices [39]. In Myanmar, conflict-driven fertilizer shocks weakened productivity incentives and the efficiency of input use [25].

Post-harvest losses are a less visible but important barrier to integration. Higher-value markets require consistent quality, storage, handling and delivery. Experimental evidence from Ethiopia shows that relatively small policy changes can accelerate adoption of improved on-farm storage technologies, suggesting that adoption in low-liquidity contexts often depends on institutional support rather than information alone [40]. In fragile contexts, storage and handling technologies can function as market-integration infrastructure because they allow farmers to avoid distress sales and meet quality requirements.

Extension and training remain important, but their effect depends on continuity and trust. West Bank evidence links agricultural extension to technology adoption under occupation-related constraints [28]. In Afghanistan, development-program evidence shows that intended production outcomes can diffuse beyond target areas, while also generating unintended political and spatial consequences in a fragile setting [29]. In Palestine, organic farming is associated with higher technical efficiency in olive production, suggesting a possible value-addition route under severe geopolitical constraint [41]. These findings indicate that production upgrading must be coupled with credible routes to market; otherwise, technical success may not translate into integration [7,8].

3.3. End-Markets and Trade

End-market constraints appear through restricted access, unstable demand, buyer concentration and weak spatial arbitrage. In Somalia, conflict slows price transmission in cereal markets, consistent with the view that conflict acts as a transaction cost wedge between spatially connected markets [27]. In Sudan, cereal market integration is weak and heterogeneous under a combination of sanctions, conflict and macroeconomic instability [26]. For smallholders, weak price transmission means that market signals are less

reliable. Decisions about when to sell, where to sell and whether to invest in quality are then made under greater uncertainty.

Standards and compliance costs provide another gatekeeping mechanism. Research on high-value horticulture indicates that sustained participation depends on transparent grading, reliable buyers and payment assurance [33]. In certified coffee systems, training and access to credit are linked to technical efficiency, demonstrating that standards alone do not create integration unless support services help farmers comply [42]. Thus, under political constraint, premium markets may become inaccessible not simply because farmers lack capacity, but because the institutions that make quality signals credible are weak or costly.

Market power is a further concern. When buyer options are thin, the form of contract can influence whether firms are able to markdown prices received by farmers, as shown in a high-value crop context in India [43]. In constrained settings, this is particularly relevant because exit options are limited and enforcement is costly. Strengthening end-market integration therefore requires more than connecting farmers to a buyer. It requires credible grading, payment discipline, dispute resolution and midstream finance for aggregation, storage and reliable delivery [36].

3.4. Governance of Value Chains

Governance problems begin where exchange is exposed to information asymmetry, opportunism and enforcement weakness. Contract farming is often proposed as an integration tool, but evidence shows that contracts can fail when farmers distrust grading, prices, repayment terms or payment timing. In Ghana, smallholders reported dissatisfaction and dropout from contract schemes despite economic benefits, mainly because of mistrust and perceived lack of transparency [44]. Similar preferences for transparent grading and reliable payments appear in evidence on participation in modern value chains [33].

Producer organizations and cooperatives offer a different governance route. By pooling volume, coordinating transport and sharing information, cooperatives can lower per-unit marketing costs and strengthen bargaining power. Palestinian olive-farm evidence indicates that cooperatives can improve efficiency and productivity under severe constraints [31]. However, cooperatives are not inherently effective. They require managerial capacity, member trust, accountability and service quality. Without these conditions, collective action may reproduce exclusion or become vulnerable to elite capture [9].

Trader-led coordination is also common in constrained environments. Traders are often the actors who can move information, credit and products despite risk. Recent work on farmer-trader governance mechanisms shows that such linkages can support resilience and sustainability goals when incentives are aligned and relationships are credible [45]. Yet reliance on traders also creates vulnerability when competition is low and grading is opaque. The central governance question is therefore not whether a particular form exists, but whether it reduces transaction costs while maintaining transparency and fair risk distribution.

3.5. Sustainable Production and Energy Use

Sustainable production in conflict settings is constrained by the practical feasibility of maintaining production, processing and logistics. Conflict changes land use and damages or disrupts infrastructure, as Syrian crop evidence demonstrates [39]. In Myanmar, fuel and electricity interruptions were among the factors affecting agrifood chain operation and widening gaps between producer and consumer prices [8]. Energy reliability is therefore not only a technical input; it is part of the coordination infrastructure that allows food to move, be processed and retain value.

Two enabling pathways emerge from the literature. The first is governance for resilience: relational stability and coordinated investments can make chains better able to continue functioning under shock [45]. The second is sustainability-oriented upgrading linked to credible market channels. Palestinian olive evidence suggests that organic farming may improve technical efficiency and support value-addition possibilities under geopolitical constraint [41]. Certified coffee evidence similarly indicates that sustainability standards require complementary training and credit to produce efficiency gains [42].

The evidence also reveals a gap. Many studies show adoption or efficiency effects, but fewer demonstrate whether these effects translate into price premia, sustained premium market access or improved bargaining power. For a sustainability journal, this gap is important. Sustainable production practices may remain economically fragile if farmers cannot access markets that reward them. Read against the Sustainable Development Goals, these findings connect most directly to responsible production and resource use (SDG 12), affordable and reliable energy (SDG 7) and climate-resilient practice (SDG 13): where energy and processing are interrupted, both the environmental and the economic value of upgrading is lost. The recurring disconnect between efficiency gains and rewarded market access is itself a sustainability problem, because environmentally sound practices and voluntary sustainability standards deliver gains only when complementary services make compliance credible and premium channels remain reachable [17].

3.6. Value Chain Finance

Finance constraints under political restriction involve more than credit. They include liquidity, payment systems, working capital, transaction records, risk-sharing and the capacity of midstream actors to procure, store, transport and process products. Where banking systems are disrupted, procurement slows, margins widen and farm-gate incentives weaken [7,8]. This is especially important because the midstream is often where value is added and quality is maintained, yet it is frequently underfinanced [36].

The literature points toward embedded finance rather than stand-alone credit. Agricultural value-chain finance is most effective when it is built on transaction histories, service bundles and relationships that allow lenders to understand production and marketing risk [38]. Resource-providing contracts illustrate one form of embedded finance because input credit and technical support are tied to a marketing relationship [37]. Yet embedded finance also creates dependence if terms are unclear or enforcement is uneven. Dissatisfaction with contract schemes shows that financial integration can become a source of exit when trust and transparency are absent [44].

A practical distinction is needed between finance for production and finance for integration. Production finance helps farmers purchase inputs. Integration finance supports aggregation, assured payment, storage, quality preservation, transport and the working capital of traders and processors. Under constraint, the second category may be more binding than the first because it determines whether market participation can be timely, credible and quality-oriented.

3.7. Business Environment and Socio-Political Context

The enabling environment is the dimension that amplifies all others. Conflict raises the cost of moving goods and information, reduces spatial arbitrage, weakens price transmission and increases volatility [26,27]. In Myanmar, disruptions to banking, transport, fuel, electricity and internet access shaped margins, prices and food affordability [8]. These conditions are not background variables; they determine whether chain governance remains viable.

Land access and institutional capacity are also central. In Nigeria, conflict shocks reduced land rental market activity, while institutional factors such as credit access and women's participation in decision-making moderated the effect [30]. In the West Bank, land and movement restrictions shape technology adoption and investment horizons [28]. Mobility restrictions associated with checkpoints and the separation wall also increase travel time and distance, raising the unpredictability of ordinary economic activities [46].

Interventions in such environments cannot substitute for political resolution. However, they can reduce the degree to which political constraint becomes value-chain failure. Relevant levers include reducing post-harvest losses through storage support [40], strengthening financial systems that build transaction histories [38], and designing institutions that stabilize access to land, services, quality infrastructure and market information.

Equity and gender belong in this dimension because political constraint rarely bears on all producers equally. Where mobility is restricted, where land and credit are unequally held, and where decision-making is gendered, the same checkpoint, payment delay or grading dispute translates into a larger loss of integration for women and asset-poor producers, who are concentrated in the lower-return nodes of the chain and have the fewest fallback options [16]. Evidence that institutional factors such as credit access and women's participation in decision-making moderate the effect of conflict shocks on land markets [30], and that value-chain participation does not translate into empowerment where power relations and gendered risks are unaddressed [6], indicates that integration measured only as average participation can mask widening intra-chain inequality. Treating gender and equity as a cross-cutting condition of integration, rather than as a separate node, follows directly from the diagnostic logic of this review and is necessary if value-chain development is to advance, rather than undercut, the equality-oriented Sustainable Development Goals [16].

4. Cross-Cutting Synthesis: Governance and Institutions as a Conditional Bridge

Across the seven dimensions, the same pattern recurs. The most binding constraints are not only technical. They are transactional and institutional: high search and transport costs, uncertain payments, weak price transmission, unreliable quality signals, financing gaps and enforcement risk. Governance and institutions matter because they can bridge the gap between smallholders and markets by making exchange more predictable. However, the bridge is conditional. It works when it reduces specific transaction costs and aligns risk-sharing with farmers' expectations of fairness. It breaks down when transparency is weak, enforcement is not credible or benefits are captured by better-positioned actors.

Two bridging mechanisms are especially prominent. The first is collective action through producer organizations and cooperatives. Evidence from Kenya shows that collective marketing by smallholder banana farmers improved income even when price premiums were modest [47]. Ethiopian evidence associates cooperative membership with improved wellbeing and faster technology adoption [48,49]. These findings are consistent with the idea that cooperatives can lower marketing costs, improve service access and strengthen bargaining. Yet the benefits depend on governance quality; weak management, elite capture or inability to enforce side-selling discipline can undermine the arrangement [9].

The second mechanism is vertical coordination through contracts and relational exchange. Contract farming can stabilize outlets and provide service bundles, but the design matters. Resource-providing contracts in Ghana were more effective than simple marketing contracts because they addressed input and liquidity constraints [37]. Meta-evidence finds positive income effects for contract farming, but also warns of selection, publication and

survivor biases [50]. Relational contracting can discipline exchange where formal enforcement is limited, as shown in Kenyan rose exports during a supply shock [51]. Nevertheless, trust is fragile. If grading is perceived as arbitrary or payments are delayed, side-selling and exit become rational responses [44].

The bridge is described as conditional because the evidence includes clear cases in which governance arrangements did not improve integration, or actively shifted risk onto farmers. Contract schemes in Ghana generated dissatisfaction and dropout despite measurable economic benefits, because grading and payment terms were not trusted [44]. Collective action delivered welfare gains only where it avoided weak governance and elite capture, and reproduced exclusion where it did not [9]. Meta-analytic evidence on contract farming reports positive average income effects but warns that selection, survivorship and publication biases inflate them, so that the favorable cases are not the whole picture [50]. Where buyer options were thin, the form of contract itself enabled firms to mark down prices received by farmers [43]. And value-chain participation did not translate into improved nutrition or empowerment where power relations and gendered risks were left unaddressed [6]. These disconfirming cases are not exceptions to the argument but the evidence that defines its conditions: they are the reason the four safeguards—transparency, credible enforcement, fair risk-sharing and protection against opportunism—are stated as necessary rather than incidental, and the reason the framework in Figure 2 routes the same arrangements either to integration or to exclusion depending on whether those safeguards hold.

Table 3 summarizes four institutional arrangement categories that recur in the evidence and links them to mechanisms, expected integration effects and likely failure modes.

Table 3. Institutional arrangements, mechanisms, expected effects and typical failure modes.

Institutional Arrangement	Mechanism	Expected Effect on Market Integration	Typical Failure Mode
Market-support institutions	Reduce information asymmetry; stabilize grading, inspection and price discovery; improve market intelligence [52].	More credible planning, lower rejection risk and greater ability to participate in standards-based or premium channels.	Information does not translate into better terms because of market power; services are inaccessible, costly or captured.
Collective action institutions	Pool output, coordinate logistics, share services and strengthen bargaining [47–49].	Higher participation intensity, better service access and potential entry into higher-value channels.	Weak internal governance, elite capture, low member trust, poor service quality or side-selling discipline failure.
Contracting institutions	Stabilize buyer-seller relations, bundle inputs, credit and advice, specify quality and allocate risk [37,44,50].	Reduced price and payment risk, stronger upgrading incentives and improved service access.	Opaque grading or pricing, delayed payment, weak enforcement, opportunism or farmer dissatisfaction.
Public enabling institutions	Lower transport and time costs, support storage and trade facilitation, improve regulatory predictability [36,40].	Larger effective market size, improved spatial integration and greater feasibility of quality upgrading.	Infrastructure inaccessible or politically constrained; benefits bypass smallholders or reinforce unequal access.

5. Measuring Market Integration and Assessing Evidence Quality

Market integration is multidimensional, and the evidence base reflects this diversity. At household level, commercialization indices and the share of output sold remain useful because they connect participation to welfare and nutrition outcomes [53,54]. However, they may overstate integration if sales are distress-driven or if farmers sell through low-return channels without stable relationships. Channel-based measures address this limitation by distinguishing traditional, modern, export-oriented or premium channels and by examining whether participation is sustained [32,33].

Market-system measures are especially useful in conflict-affected settings. Price transmission, cointegration, price dispersion and margin analysis show whether markets are connected and whether incentives move across space [26,27]. These indicators are not substitutes for household evidence, but they help explain why farmers may remain weakly integrated even when they are willing to produce for market. If spatial arbitrage is slow or margins widen because of transport, banking or security disruptions, farm-level upgrading will not be reliably rewarded [7,8].

Complementary indicators are therefore needed: price received, payment timing, rejection rates, grading transparency, transaction costs, storage losses, access to finance, bargaining outcomes and continuity of buyer relationships. The evidence quality is uneven. Cross-sectional studies remain common, and selection bias is a particular concern in cooperative and contract-farming research because more capable farmers may self-select into arrangements [50]. Political constraints also complicate causal inference because conflict intensity can jointly shape participation, input use, land access and prices. Future empirical studies should combine household commercialization and channel-choice data with market-system indicators and should model interaction effects among infrastructure, information, collective action and governance.

Table 4 sets out four families of measurement that future studies can combine, stating for each the kind of evidence it provides, its main strength, and its characteristic limitation under constraint. The families are complementary rather than substitutable: household and channel measures show whether and how farmers participate, market-system indicators show whether the surrounding market can support credible participation, and governance and transaction-cost indicators link the two by capturing the mechanisms—payment delay, grading transparency, rejection rates and dispute resolution—through which constraint is actually felt.

Table 4. Practical measurement options for future studies of market integration under constraint.

Measurement Family	Example Indicators	Strength	Limitation Under Constraint
Household commercialization	Share or value of output sold; commercialization index [53,54].	Directly captures participation intensity and can be linked to welfare outcomes.	May confuse distress sales with sustainable integration.
Channel and relationship measures	Modern/premium channel participation; repeated buyer relationship; contract or cooperative membership [32,33].	Captures quality of integration and possibility of upgrading.	Selection effects and survivorship bias can be substantial.

Table 4. *Cont.*

Measurement Family	Example Indicators	Strength	Limitation Under Constraint
Market-system indicators	Price transmission, cointegration, margins and price dispersion [26,27].	Useful where household data are limited and market connectivity is the concern.	Does not identify which farmers benefit or lose.
Governance and transaction-cost indicators	Payment delay, grading transparency, rejection rates, transport time, search costs and dispute resolution.	Links mechanisms to observed participation outcomes.	Requires detailed surveys or mixed methods often difficult in fragile areas.

6. Discussion

6.1. Relation to Prior Evidence

The central finding—that governance and institutions function as a conditional bridge—is consistent with New Institutional Economics, which predicts that hybrid arrangements between spot markets and hierarchy emerge precisely where uncertainty, asset specificity and enforcement costs are high [34,35], and with global value-chain scholarship, which links integration outcomes to how exchange is coordinated and governed rather than to production alone [23,24,55]. It agrees with evidence that midstream coordination and service bundles, not farm productivity by itself, determine whether quality and reliability are rewarded [1,36], and with the participation-threshold tradition showing that fixed and proportional transaction costs keep farmers below profitable engagement [20,21]. To this shared ground the review adds an explicit boundary condition: the same governance form behaves differently once the transaction environment deteriorates.

The synthesis also qualifies, and in places contradicts, more optimistic readings of value-chain participation. Studies reporting income or adoption gains from cooperatives and contracts in stable settings [47–49] cannot simply be extrapolated to constrained ones, because the arrangement that works under stable logistics can fail under checkpoint delays, banking disruption or thin competition [7,8,43,44]. The evidence is therefore better read as conditional on enforcement credibility than as a general endorsement of any organizational form, which is where the review departs from a straightforward participation-to-income or participation-to-nutrition pathway [3,6]: reliability of exchange, not participation as such, is the mediating variable, and where reliability is absent governance can shift risk onto farmers rather than lift it [43,44,50]. The resulting position is closer to the cautious, governance-quality-dependent view of collective action [9] than to accounts that treat organizational form as sufficient, and it explains why disconfirming cases recur across otherwise dissimilar settings.

6.2. Contribution and Novelty

Three contributions follow. First, the review organizes a dispersed and methodologically heterogeneous literature into a single seven-dimension diagnostic that locates where political constraint is transmitted across the chain and—unlike framework diagrams that merely enumerate factors—specifies the mechanism linking them, namely governance acting as a bridge whose performance is gated by four conditions: transparency, credible enforcement, fair risk-sharing and protection against opportunism. Second, it distinguishes finance for production from finance for integration, arguing that under constraint the latter—assured payment, aggregation, storage, quality preservation and midstream working capital—is often the more binding and the more neglected [36–38]. Third, it positions

the reliability of exchange as a sustainability variable: where energy, payments and enforcement fail, both the environmental and the economic value of upgrading is lost, and sustainability standards deliver gains only when complementary services make compliance credible [17,42]. Taken together, these shift the question from whether smallholders participate to whether the relationships through which they participate are reliable enough to justify investment—the question on which the Sustainable Development Goals most exposed to chain reliability, SDGs 1, 2, 5, 8, 10 and 12, ultimately turn [2,17].

7. Conclusions

Smallholder market integration in conflict-affected and politically constrained settings is best understood as a jointly produced outcome of value-chain capability and institutional reliability. The reviewed evidence shows that the most persistent barriers are transactional and systemic: high transport and search costs, financial disruption, weak price transmission, uncertain enforcement, opaque grading, thin buyer options and discouragement of quality investment. These constraints do not always stop trade, but they reduce the credibility and profitability of sustained market participation.

Governance and institutional arrangements can bridge this gap. Cooperatives, resource-providing contracts, trader coordination, market-support institutions and public enabling arrangements can reduce transaction costs, stabilize exchange and support upgrading. Yet these arrangements are conditional. They must provide transparency, credible enforcement, fair risk-sharing and protection against opportunism. Where these conditions are absent, governance mechanisms may reproduce market exclusion or shift risk onto farmers.

For sustainable agri-food value chains, the central task is therefore not only to connect smallholders to markets, but to make market relationships reliable enough to justify investment. Future research and policy should assess integration through multiple indicators, including household commercialization, channel sustainability, price transmission, transaction costs, governance quality and institutional durability under shock.

7.1. Practical Implications

Several practical implications follow for development partners and policymakers. First, interventions should prioritize the reduction in time-cost volatility and post-harvest loss, not only road construction or farm productivity; storage, aggregation and payment systems can be as important as input supply [36,40]. Second, cooperative development should focus less on forming groups and more on governance quality, service delivery, financial sustainability and member accountability, because organizational form without governance quality can reproduce exclusion [9]. Third, contract farming should be designed around transparent pricing, clear grading criteria, timely payment and credible dispute mechanisms; resource-providing contracts can be effective when they genuinely ease input and liquidity constraints, but can also create dependence if farmers cannot verify terms [37,44]. Fourth, market-support institutions—grading services, market-information systems, inspection and quality assurance—should be treated as sustainability infrastructure, since mobile-phone information can reduce price dispersion and search costs but is insufficient where market power or movement restriction prevents farmers from acting on it [52]. In politically constrained settings such as the West Bank, where extension, cooperatives and organic upgrading produce measurable benefits but operate within binding land and mobility limits [28,31,41,46], the most defensible strategy is to design integration around risk reduction before asking farmers to upgrade, while avoiding overclaims: value-chain governance can reduce some consequences of political constraint, but it cannot compensate for restrictions that alter market geography, land access and enforcement [46].

7.2. Limitations

This review has limitations. It is an integrative review rather than a systematic review or meta-analysis, and although the search, eligibility and appraisal procedures were made explicit and are reported in Section 2, Figure 1 and Appendix A, comprehensive retrieval of all relevant studies is not claimed. The evidence base is heterogeneous—spanning households, value-chain actors, markets, prices, adoption, land access and resilience—which is analytically useful but limits direct comparison and precludes statistical pooling. Quality appraisal with the MMAT is necessarily flexible across designs, and the corpus is bounded by peer-reviewed sources in accessible languages, so gray literature and non-indexed regional scholarship are under-represented. These limitations are mitigated by transparent reporting and by weighting evidence according to appraised quality, but they should temper the strength of any single causal claim.

7.3. Future Research

Future research should move in five directions. First, it should model interaction effects among infrastructure, information, collective action and governance rather than estimating each factor in isolation. Second, it should combine household market-integration indicators with market-system indicators such as price transmission and margins. Third, it should examine who is excluded from governance arrangements, not only who benefits, using gender- and equity-disaggregated outcomes. Fourth, it should study institutional durability under shocks—whether cooperatives, contracts, trader relationships and public-private mechanisms continue to function when transport, finance and enforcement are disrupted. Fifth, it should connect integration outcomes explicitly to environmental and Sustainable Development Goal indicators, so that the economic and the ecological value of upgrading are assessed together rather than separately [2,17].

Author Contributions: Conceptualization, I.H.M. and F.K.; methodology, I.H.M. and F.K.; formal analysis, I.H.M.; investigation, I.H.M. and F.K.; data curation, I.H.M.; writing—original draft preparation, I.H.M.; writing—review and editing, I.H.M. and F.K.; visualization, I.H.M.; supervision, F.K.; project administration, I.H.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: No new data were created or analyzed in this study. The review is based on published literature cited in the reference list. The extraction and coding matrix supporting the synthesis is provided in Appendix A.

Acknowledgments: The authors thank the scholarly community whose published work made this synthesis possible.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1 presents the extraction and quality-appraisal matrix for the empirical studies that anchor the dimension-level synthesis. For each study it records the setting, the chain node addressed, the constraint type, the governance or institutional arrangement examined, the integration outcome or proxy reported, the study design, and the methodological quality rating. This matrix is the audit trail underlying the synthesis in Sections 3 and 4.

Table A1. Coded extraction and quality-appraisal matrix for the empirical evidence corpus.

Study	Setting/Context	Chain Node(s)	Constraint Type	Governance/Institutional Arrangement	Integration Outcome or Proxy	Design	MMAT
[7]	Myanmar (post-coup)	Farm-milling-retail	Transport and banking disruption	Trader/market coordination (observed)	Margins, retail prices, price dispersion	Quant. descriptive	4/5
[8]	Myanmar	Whole agrifood chain	Banking, fuel, power, connectivity	Cross-node coordination	Input, farm-gate and retail prices; diet cost	Quant. descriptive	4/5
[25]	Myanmar	Input supply/on-farm	Violent conflict intensity	Input-market functioning	Fertilizer price, use, efficiency	Quant. non-randomized	5/5
[26]	Sudan	Markets and trade	Fragility, sanctions, macro instability	Spatial market integration (price)	Cointegration/adjustment	Quant. descriptive	5/5
[27]	Somalia	Markets and trade	Conflict as transaction-cost shock	Spatial market linkage	Speed of price transmission	Quant. non-randomized	4/5
[28]	West Bank	Production and extension	Occupation, land and movement	Agricultural extension	Technology adoption	Quant. non-randomized	4/5
[31]	West Bank	Production/marketing	Geopolitical constraint	Agricultural cooperatives	Efficiency, TFP, cooperative effect	Quant. non-randomized	4/5
[41]	West Bank	Production	Geopolitical constraint	Organic upgrading	Technical efficiency	Quant. non-randomized	4/5
[39]	Syria	Cropland/land use	Civil war	Environmental baseline	Cropland variability; food security	Quant. descriptive (remote sensing)	4/5
[40]	Ethiopia	On-farm storage	Liquidity/low adoption	Policy and institutional support	Adoption of improved storage	Randomized/experimental	5/5
[29]	Afghanistan	Production and delivery	Fragile-state program dynamics	Development program	NDVI yield trends; spillovers	Mixed methods	3/5
[30]	Nigeria	Enabling environment	Violent conflict shocks	Credit access; women's decision-making	Land-rental size and value	Quant. non-randomized	4/5
[37]	Ghana	Production and marketing	Input and liquidity constraints	Resource-providing vs. marketing contracts	Input use, yields	Quant. non-randomized	5/5
[44]	Ghana	Governance/contracting	Mistrust, opaque terms	Contract farming	Satisfaction, dropout, side-selling	Mixed methods	4/5
[42]	Honduras	Standards and production	VSS compliance costs	Voluntary standards + training/credit	Technical efficiency	Quant. non-randomized	4/5
[43]	India	Buyer-seller	Thin buyer options/market power	Contract type	Price markdown/market power	Quant. non-randomized	4/5
[47]	Kenya	Collective marketing	Market-access barriers	Farmer collective action	Income, participation	Quant. non-randomized	5/5
[51]	Kenya	Buyer-seller (export)	Supply shock	Relational contracting	Trade continuity; value of relationships	Quant. non-randomized	5/5

Note: Table A1 reports the extraction and quality coding for the empirical studies that anchor the dimension-level synthesis; the remaining corpus studies were coded with the same five fields and appraised with the same tool. MMAT = Mixed Methods Appraisal Tool, version 2018 [15]; ratings give the number of the five design-appropriate criteria met. Source: authors' elaboration.

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