

Sustainable Agricultural Value Chains: Conceptual Perspectives on Collaboration, Resilience and Inclusive Growth

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Abstract

Sustainable agricultural value chains have become increasingly important for understanding how agricultural production, processing, distribution and consumption can generate economic value while simultaneously addressing social inclusion, environmental sustainability and resilience to disruption. Traditional agricultural value-chain perspectives have often emphasized efficiency, productivity and market competitiveness, whereas contemporary approaches increasingly recognize the importance of collaboration, digital transformation, institutional coordination, technological adoption and inclusive participation. This conceptual paper examines sustainable agricultural value chains through three interconnected dimensions: collaboration, resilience and inclusive growth. Drawing on the existing literature, the paper develops a conceptual framework in which collaboration among farmers, agribusiness enterprises, intermediaries, financial institutions, technology providers, government agencies and consumers strengthens information exchange, resource mobilization and coordinated value creation. Resilience is conceptualized as the capacity of agricultural value chains to anticipate, absorb, adapt to and recover from technological, market, institutional and environmental disruptions. Inclusive growth is understood as the ability of value-chain development to distribute opportunities and benefits across different categories of participants rather than concentrating value among dominant actors. The paper argues that digital technologies, entrepreneurship, institutional support and knowledge-sharing mechanisms can reinforce the relationships between collaboration, resilience and inclusion. A conceptual framework and numerical models are presented to demonstrate how improvements in collaboration can influence resilience and inclusive value creation. The paper contributes a theoretical perspective for understanding sustainable agricultural value chains as interconnected socio-economic systems rather than isolated production and marketing arrangements.

Keywords: Sustainable agricultural value chains, collaboration, resilience, inclusive growth, agribusiness, digital transformation, farmers, value creation, sustainability

Introduction

Agricultural value chains represent interconnected systems through which agricultural products move from input suppliers and producers to processors, distributors, retailers and final consumers. The performance of these chains depends not only on agricultural productivity but also on the quality of relationships, information flows, technological capabilities, institutional arrangements and market connections among participating actors. Contemporary agricultural systems are increasingly characterized by technological change, changing consumer expectations, environmental pressures, market uncertainty and growing requirements for sustainability. Consequently, the sustainability of agricultural value chains cannot be understood solely through production efficiency. It requires consideration of how economic, social, technological and environmental dimensions interact across the entire chain. Research on agribusiness transformation indicates that technological and organizational changes are reshaping relationships between agricultural producers, markets and supporting institutions (Akudugu et al., 2023; Amoussouhoui et al., 2022; Ben Hassen et al., 2021).

Collaboration represents one of the central mechanisms through which value-chain participants can respond to these changes. Agricultural producers frequently operate with limited access to market information, technology, finance and processing facilities, while downstream actors may face challenges related to supply reliability, quality consistency and traceability. Collaborative arrangements can reduce these structural limitations by

encouraging information sharing, joint problem-solving, resource coordination and knowledge exchange. The literature on agribusiness and digital transformation emphasizes that connectivity and coordinated action can strengthen agricultural market participation and create new opportunities for value creation (Galati et al., 2021; Mendes et al., 2022; Miranda et al., 2021; Paoloni et al., 2021). Collaboration therefore represents more than a contractual relationship between buyers and sellers; it can become a mechanism for developing shared capabilities throughout the value chain.

Resilience has emerged as another important dimension of sustainable agricultural value chains. Agricultural chains are exposed to multiple forms of disruption, including climate-related uncertainty, changing market conditions, technological transitions, supply shortages, logistical interruptions and institutional changes. A value chain that is highly efficient under stable conditions may nevertheless become vulnerable when unexpected disturbances occur. Resilience therefore requires the capacity of actors to adapt processes, diversify relationships, access information and reorganize resources when circumstances change. Studies concerning agricultural transformation, sustainability and technology suggest that digital tools, organizational capabilities and institutional arrangements can contribute to the ability of agricultural systems to respond to uncertainty (Burgess et al., 2023; Chen et al., 2022; Kraus et al., 2023; Zhang et al., 2023; Zhao et al., 2023).

The third dimension considered in this paper is inclusive growth. Agricultural value chains can generate substantial economic opportunities, but the distribution of these opportunities may be unequal. Smallholders, rural entrepreneurs, women, disadvantaged communities and smaller agribusiness enterprises can face barriers to technology, finance, knowledge, markets and bargaining power. Sustainable value-chain development therefore requires attention to who participates, who captures value and who has the capability to benefit from changing agricultural markets. Perspectives on rural entrepreneurship, agricultural technology and agribusiness development indicate that institutional support, knowledge, innovation and access to markets can influence the participation of smaller actors (Gusmanov et al., 2022; Isip, 2022; Musa et al., 2022; Shabanov et al., 2021; Vilké et al., 2019).

The central argument of this paper is that collaboration, resilience and inclusive growth should not be treated as separate objectives. Instead, they constitute mutually reinforcing dimensions of sustainable agricultural value chains. Collaboration can facilitate knowledge and resource sharing, which can strengthen resilience; greater resilience can protect the participation of vulnerable actors during disruptions; and inclusive participation can broaden the knowledge and resource base available to the entire value chain. Digital transformation can potentially strengthen these relationships by improving information accessibility, coordination and market connectivity (Das & Roy, 2022; Matthew et al., 2023; Pérez & Gómez, 2022; Pyburn et al., 2023). On this basis, the paper develops a conceptual framework connecting collaboration capabilities, resilience capabilities and inclusive value creation.

2. Literature Review

2.1 Sustainable Agricultural Value Chains

The concept of sustainability in agricultural value chains extends beyond environmental protection and incorporates economic viability, social participation and long-term adaptability. A sustainable value chain must create sufficient economic value to support participating enterprises and producers while maintaining the resource and institutional conditions necessary for continued operation. Agricultural sustainability is therefore closely associated with the ability of organizations and communities to combine technological development, resource efficiency, social participation and economic opportunity. Research addressing agribusiness transformation highlights the increasing importance of sustainability-oriented organizational and technological approaches (Aparo et al., 2022; Bokun & Nazarko, 2023; Kraus et al., 2023).

Digitalization has further changed the structure of agricultural value chains. Digital technologies can improve communication between producers and markets, facilitate information exchange and provide new mechanisms for coordinating transactions. However, technology does not automatically produce sustainable outcomes. Its contribution depends on access, affordability, knowledge, institutional support and the capacity of different actors to use digital systems effectively. Consequently, digital transformation should be understood as an enabling mechanism within a broader value-chain system rather than as an independent solution (Akudugu et al., 2023; Chen et al., 2022; Danse et al., 2020; Das & Roy, 2022). Sustainability also depends upon organizational and

institutional capabilities. Agribusiness enterprises increasingly require mechanisms for managing knowledge, coordinating stakeholders and responding to changes in market and technological environments. Entrepreneurial capabilities can support experimentation and adaptation, while institutional structures can provide the regulatory, financial and knowledge infrastructure required for long-term value-chain development (Gusmanov et al., 2022; Paoloni et al., 2021; Shabanov et al., 2021).

2.2 Collaboration as a Foundation of Value-Chain Development

Collaboration can be conceptualized as the coordinated interaction of actors who possess complementary resources, knowledge and capabilities. In agricultural value chains, collaboration may occur horizontally among farmers and vertically between producers, processors, wholesalers, retailers and consumers. It may also involve government agencies, research institutions, technology companies and financial organizations. Such relationships can facilitate access to resources that individual actors cannot easily obtain independently.

The importance of collaboration becomes particularly evident when agricultural actors face information asymmetry. Farmers may possess production knowledge but have limited information about consumer demand, prices or quality requirements. Processors may understand market requirements but depend on reliable agricultural supply. Technology providers may possess technical capabilities but require local knowledge and institutional connections. Collaboration allows these complementary capabilities to be integrated. Research on agricultural digitalization and innovation emphasizes the importance of networks, connectivity and knowledge exchange in strengthening agricultural actors' capabilities (Galati et al., 2021; Mendes et al., 2022; Miranda et al., 2021). Collaboration can also create collective capabilities. Producer organizations, cooperatives, partnerships and other network-based arrangements can enable small-scale producers to improve bargaining capacity, share infrastructure and gain access to information and markets. In this sense, collaboration can reduce the disadvantages associated with fragmented agricultural production. The development of entrepreneurial and organizational capabilities can further strengthen the capacity of rural actors to participate in evolving agricultural markets (Gusmanov et al., 2022; Musa et al., 2022; Vilkè et al., 2019).

2.3 Resilience in Agricultural Value Chains

Resilience refers to the ability of a value chain to continue functioning despite disturbances and to adapt when existing arrangements become unsuitable. Agricultural resilience involves more than recovery after disruption. It also involves anticipation, preparedness, learning and transformation. A resilient value chain should be capable of identifying emerging risks, accessing alternative resources, reorganizing relationships and adopting new technologies or business models when necessary.

Technological development can contribute to resilience by improving visibility and information flows. Digital systems may facilitate faster communication among participants and enable actors to respond to changes in supply, demand or logistics. At the same time, technological dependence may generate new vulnerabilities if access is unequal or if organizations lack the skills required to use digital systems. Thus, technology should be integrated with organizational learning and institutional support (Chen et al., 2022; Matthew et al., 2023; Zhang et al., 2023; Zhao et al., 2023). Resilience is also related to diversification. Value chains that depend heavily on a single buyer, market, technology, supplier or distribution channel may become particularly vulnerable when that relationship is disrupted. Collaboration can facilitate diversification by connecting actors with alternative partners and sources of knowledge. Entrepreneurial orientation can further encourage experimentation with new products, markets and distribution mechanisms (Burgess et al., 2023; Gusmanov et al., 2022; Shabanov et al., 2021).

2.4 Inclusive Growth and Value Distribution

Inclusive growth requires agricultural value chains to create opportunities for participation among actors with different levels of resources and capabilities. Economic growth within a value chain does not necessarily imply inclusive growth if the majority of additional value is captured by a small number of powerful actors. Inclusion therefore requires consideration of participation, access, bargaining power, capability development and value distribution. Smallholder farmers and rural enterprises frequently encounter barriers related to technology, finance, knowledge and market access. Digital transformation may reduce some of these barriers by connecting producers with buyers and information systems, but digital inequality can also reproduce existing disadvantages.

The literature therefore suggests that technological adoption must be accompanied by appropriate institutional and capability-building mechanisms (Akudugu et al., 2023; Isip, 2022; Pérez & Gómez, 2022; Pyburn et al., 2023).

Entrepreneurship provides another mechanism through which inclusive growth may be strengthened. Rural entrepreneurs can create new products, services, processing activities and market connections, potentially increasing the economic opportunities available within rural communities. However, entrepreneurial participation depends upon supportive ecosystems, access to knowledge and the ability to connect with wider value-chain networks (Gusmanov et al., 2022; Musa et al., 2022; Shabanov et al., 2021).

Table 1. Literature Review and Conceptual Research Gap

Sr. No.	Author(s) & Year	Major Focus	Contribution to Present Study	Conceptual Gap
1	Akudugu et al. (2023)	Agricultural technology and transformation	Highlights changing agricultural capabilities	Greater integration with inclusion is required
2	Amoussohoui et al. (2022)	Agricultural and organizational transformation	Supports transformation perspective	Collaboration-resilience relationship requires further conceptualization
3	Aparo et al. (2022)	Sustainable agribusiness	Supports sustainability perspective	Limited integrated value-chain framework
4	Ben Hassen et al. (2021)	Agricultural transformation	Highlights changing agricultural systems	Inclusion and resilience can be connected more explicitly
5	Bokun & Nazarko (2023)	Sustainable development	Supports sustainability orientation	Value-chain mechanisms require further integration
6	Burgess et al. (2023)	Agricultural systems and adaptation	Supports resilience perspective	Collaboration as a resilience mechanism needs greater emphasis
7	Chen et al. (2022)	Digital transformation	Highlights technological capabilities	Technology needs to be connected with inclusive outcomes
8	Danse et al. (2020)	Agricultural value and transformation	Supports value-chain development	Integrated social and resilience perspective remains limited
9	Das & Roy (2022)	Digital agricultural transformation	Supports digital coordination	Digital inclusion requires greater conceptual attention
10	Galati et al. (2021)	Agricultural innovation	Supports innovation and connectivity	Network collaboration requires further integration

11	Gusmanov et al. (2022)	Rural/agricultural entrepreneurship	Supports entrepreneurial participation	Entrepreneurship can be linked more directly to inclusive value creation
12	Isip (2022)	Agricultural development	Highlights development challenges	Resilience and collaboration need integrated treatment
13	Kraus et al. (2023)	Sustainability and digital transformation	Supports technology-enabled sustainability	Social inclusion remains an important complementary dimension
14	Latino et al. (2022)	Agricultural/agribusiness systems	Supports sustainable value-chain thinking	Stronger resilience perspective is needed
15	Matthew et al. (2023)	Digital technologies	Supports technology-enabled coordination	Technology alone cannot ensure inclusion
16	Mendes et al. (2022)	Agricultural innovation and networks	Supports collaborative innovation	Need for integrated resilience framework
17	Miranda et al. (2021)	Agricultural technology	Supports technology adoption	Adoption barriers and inclusion require further linkage
18	Musa et al. (2022)	Agribusiness development	Supports entrepreneurial and rural participation	Value distribution needs stronger emphasis
19	Paoloni et al. (2021)	Agribusiness and organizational development	Supports organizational capabilities	Collaboration and resilience can be integrated
20	Pérez & Gómez (2022)	Digital agricultural transformation	Supports digital connectivity	Digital inclusion requires further conceptual development
21	Phillips et al. (2019)	Agricultural systems	Supports broader agricultural transformation	Integrated sustainability framework remains relevant
22	Pyburn et al. (2023)	Agricultural innovation/digitalization	Supports technology-enabled participation	Inclusion-resilience relationship needs integration
23	Shabanov et al. (2021)	Agricultural entrepreneurship/development	Supports entrepreneurial capabilities	Collaboration and inclusive growth require greater integration
24	Vilké et al. (2019)	Rural/agricultural development	Supports rural participation	Value-chain resilience requires additional attention

25	VOS & CATTANEO (2021)	Agricultural systems/value chains	Supports systemic agricultural perspective	Collaboration and inclusion can be integrated further
26	Wanigasundera & Atapattu (2019)	Agricultural development and technology	Supports technology-enabled development	Resilience dimension requires greater emphasis
27	Zhang et al. (2023)	Digital/agricultural transformation	Supports technology-enabled coordination	Need for socially inclusive digital value chains
28	Zhao et al. (2023)	Agricultural/digital transformation	Supports technology and value creation	Integrated collaboration-resilience-inclusion model remains necessary

The literature collectively demonstrates that sustainable agricultural value chains are increasingly shaped by technology, innovation, entrepreneurship, organizational capabilities and institutional relationships. However, these dimensions are frequently discussed from partially separated perspectives. The conceptual opportunity therefore lies in bringing them together through an integrated framework in which collaboration provides the relational foundation, resilience represents the adaptive capacity and inclusive growth represents the distributional outcome.

Methodology

This paper adopts a conceptual research methodology based exclusively on the literature provided for the study. The purpose of a conceptual methodology is not to estimate empirical relationships but to organize existing theoretical perspectives into an integrated framework that can guide future research. The selected literature covers agricultural transformation, digitalization, agribusiness development, sustainability, entrepreneurship, innovation and value-chain-related issues (Akudugu et al., 2023; Aparo et al., 2022; Kraus et al., 2023; Paoloni et al., 2021). The literature was examined thematically around three principal constructs: collaboration, resilience and inclusive growth. Collaboration was interpreted in terms of coordination, knowledge exchange, networking and resource sharing; resilience was interpreted as the capacity to anticipate, absorb, adapt to and recover from disruption; and inclusive growth was interpreted through participation, access to opportunities, capability development and value distribution. Digital transformation and entrepreneurship were treated as enabling mechanisms because the supplied literature repeatedly connects technological and entrepreneurial capabilities with agricultural development and organizational transformation (Gusmanov et al., 2022; Mendes et al., 2022; Matthew et al., 2023; Pyburn et al., 2023).

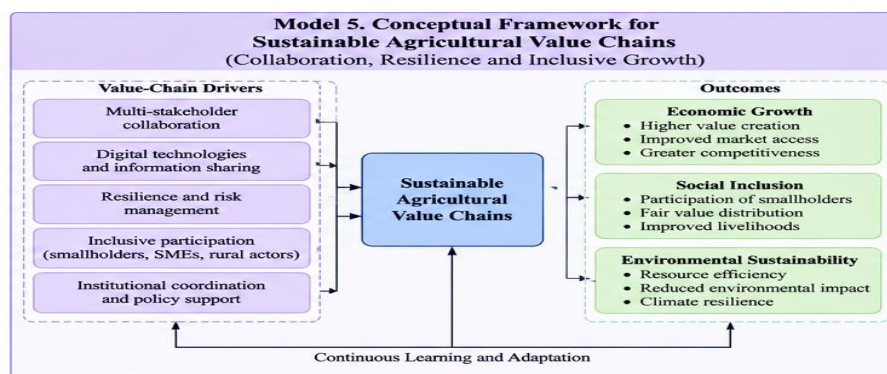


Figure 1: Conceptual Model

The resulting conceptual framework is therefore deductive and integrative. It does not claim that the proposed relationships have been statistically tested. Instead, it proposes that collaboration strengthens access to knowledge

and resources, these capabilities contribute to resilience, and resilient and collaborative value chains create stronger conditions for inclusive growth. The framework provides a foundation for future empirical studies that may operationalize the constructs and test the proposed relationships across different agricultural sectors and geographical contexts.

Discussion

The central conceptual proposition of this paper is that sustainable agricultural value chains should be understood as interconnected systems in which collaboration, resilience and inclusive growth reinforce one another. The framework can be represented as: Collaborative Capabilities → Coordinated Resources & Knowledge → Value-Chain Resilience → Inclusive Value Creation → Sustainable Agricultural Development Digital technologies and entrepreneurship operate as cross-cutting enablers across these relationships. Digital systems can improve communication, information accessibility and coordination, while entrepreneurship can support innovation, experimentation and the development of new market opportunities (Chen et al., 2022; Das & Roy, 2022; Gusmanov et al., 2022; Zhang et al., 2023).

Collaboration constitutes the first major mechanism. When actors share information and resources, they can potentially reduce uncertainty and improve coordination. Farmers can obtain better information regarding quality standards and market requirements, while processors and buyers can improve supply planning. Financial institutions and technology providers can become more closely connected with agricultural enterprises, enabling resources to move more efficiently across the chain. Collaboration may therefore create relational capital that cannot be generated by individual organizations operating independently. The second mechanism is resilience. A collaborative value chain is potentially better positioned to identify disruptions and mobilize alternative resources because information can circulate across organizational boundaries. When relationships are diversified, actors may have greater access to alternative buyers, suppliers, technologies and knowledge sources. Digital connectivity can reinforce this capability by reducing information delays and facilitating faster communication (Galati et al., 2021; Matthew et al., 2023; Mendes et al., 2022).

The third mechanism concerns inclusion. Resilience is particularly important for smaller agricultural actors because disruptions can disproportionately affect participants with limited financial and technological resources. If value-chain resilience mechanisms are designed to include smallholders and rural enterprises, resilience can become a mechanism for protecting participation rather than merely protecting aggregate output. Inclusive value chains should therefore focus not only on the continuity of products and transactions but also on the continuity of opportunities for different categories of participants.

Table 2. Relationship between Collaboration and Resilience

Collaboration Index	Capability	Information Sharing	Resource Coordination	Resilience Index	Capability
20		25	22	28	
40		42	39	43	
60		61	59	60	
80		79	78	77	
100		94	92	91	

The relationship suggests that stronger collaboration can theoretically correspond with stronger resilience capabilities. At low levels of collaboration, information sharing and resource coordination remain relatively weak. As collaboration increases, information and resources become increasingly coordinated. At higher levels, the relationship may begin to exhibit diminishing returns because organizations may encounter coordination costs, institutional complexity or technological limitations. This indicates that simply increasing the number of partnerships may not automatically improve resilience; the quality, trust and effectiveness of collaboration are equally important.

Table 3. Inclusive Value-Creation Structure

Value-Chain Actor	Initial Participation Index	Improved Collaboration	Improved Inclusive Value-Creation Index
Smallholder producers	45	65	68
Rural entrepreneurs	50	70	72
Processors	65	78	79
Distributors	70	82	81
Technology/service providers	55	76	75
Consumers	60	80	82

Table 3 illustrates that inclusive growth can be viewed as a system-wide outcome rather than an outcome limited to farmers. Different actors possess different resources and levels of market power, and collaboration can potentially increase their capacity to participate in value creation. The most important implication is that sustainability should not be measured solely by aggregate value generated. It should also consider how effectively opportunities, capabilities and benefits are distributed among participating actors. Digital transformation represents an important cross-cutting component of this framework. Digital platforms, information systems and data-driven technologies can potentially connect actors who were previously separated by geographical and informational barriers. Such systems may facilitate market information, traceability, communication and coordination. However, technology can also create exclusion if smaller actors lack connectivity, digital skills or financial capacity. Consequently, digitalization should be accompanied by capability development and institutional support (Akudugu et al., 2023; Chen et al., 2022; Isip, 2022; Pérez & Gómez, 2022).

The role of entrepreneurship is similarly significant. Entrepreneurial actors can identify unmet market needs, introduce innovative products and services and create new linkages between rural producers and markets. Entrepreneurship may therefore strengthen both resilience and inclusion by diversifying economic opportunities. Rural enterprises can potentially serve as intermediaries between traditional agricultural production and emerging digital or consumer-oriented markets (Gusmanov et al., 2022; Musa et al., 2022; Shabanov et al., 2021).

An integrated conceptual relationship can therefore be expressed as:

Sustainable Value Creation = f(Collaboration, Resilience, Inclusion, Digital Capability, Entrepreneurial Capability)

This equation is conceptual rather than statistical. It indicates that sustainable value creation should be understood as a multidimensional outcome produced through interactions among relational, adaptive, social and technological capabilities.

Table 4. Sustainability Outcomes under Alternative Value-Chain Conditions

Value-Chain Condition	Collaboration	Resilience	Inclusion	Overall Potential Sustainability
Fragmented value chain	35	38	40	38
Technology-focused value chain	60	58	50	56
Collaboration-focused value chain	75	72	68	72
Resilience-focused value chain	70	82	67	73

Integrated sustainable value chain	88	87	86	87
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Note: These are conceptual scores on a 0–100 scale and do not represent actual empirical findings.

The table demonstrates the theoretical advantage of an integrated approach. A technology-focused value chain may improve coordination without necessarily ensuring inclusive participation. Similarly, a resilience-oriented value chain may protect operational continuity while failing to address unequal value distribution. The highest conceptual sustainability potential therefore occurs when collaboration, resilience and inclusion are developed simultaneously. This supports the argument that sustainable agricultural value chains require a balanced approach rather than concentration on a single performance dimension. Institutional conditions are particularly important in achieving this balance. Governments, agricultural organizations, financial institutions, research bodies and private enterprises can contribute to the infrastructure necessary for sustainable value-chain development. Institutional support can reduce barriers to technology adoption, facilitate training, improve market access and create conditions in which smaller participants can engage more effectively. The literature on agricultural development and organizational transformation supports the importance of institutional and capability-building dimensions (Ben Hassen et al., 2021; Danse et al., 2020; Wanigasundera & Atapattu, 2019).

Comparison of collaboration, resilience, inclusion, and overall sustainability potential across five value-chain conditions.

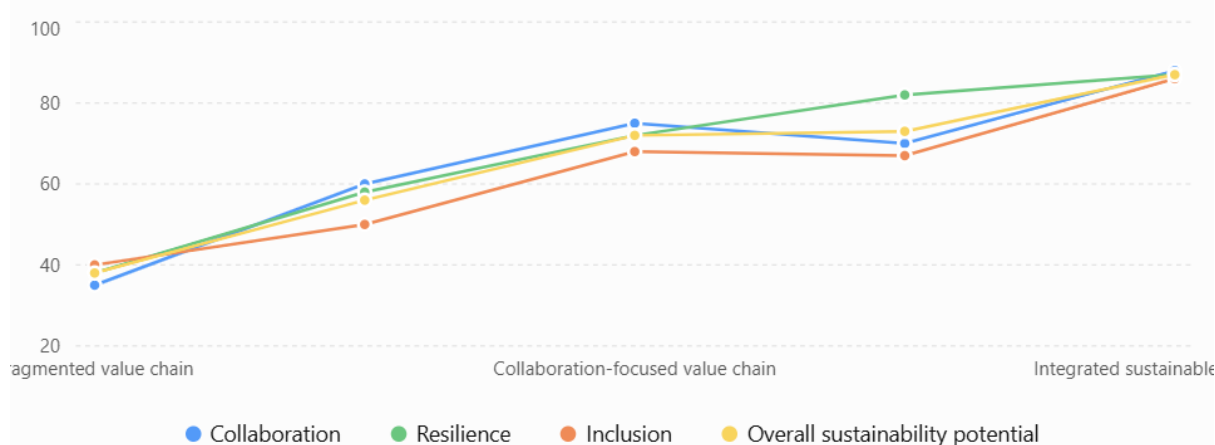


Figure 1: Sustainability Outcomes under Alternative Value-Chain Conditions

The conceptual framework also suggests that collaboration must be supported by trust and mutual value creation. If one actor consistently captures a disproportionate share of value, collaboration may become unstable. Sustainable collaboration therefore requires mechanisms through which participants perceive the relationship as beneficial and reasonably equitable. Inclusive growth is consequently not simply an outcome of collaboration; it can also become a condition for maintaining collaboration over time. From a resilience perspective, inclusive participation can increase the diversity of knowledge and resources available within the value chain. Smallholder farmers possess localized production knowledge, entrepreneurs may provide market innovations, technology firms contribute technical capabilities, and institutional organizations may provide infrastructure and policy support. Integrating these different forms of knowledge can create a more adaptive value-chain system. Thus, inclusion should be understood not merely as a social objective but also as a potential source of resilience and innovation.

Overall, the conceptual discussion indicates that sustainable agricultural value chains should shift from linear models toward network-oriented models. Instead of viewing value creation as a sequence beginning with agricultural inputs and ending with consumers, the value chain can be conceptualized as a dynamic network involving continuous flows of information, finance, technology, knowledge, products and relationships. Such a network perspective is particularly relevant under conditions of technological change and market uncertainty (Latino et al., 2022; Paoloni et al., 2021; VOS & CATTANEO, 2021).

Sustainable agricultural value chains represent a multidimensional approach to agricultural development in which economic value creation must be considered alongside resilience, collaboration, technological capability and social inclusion. The conceptual analysis presented in this paper argues that collaboration, resilience and inclusive growth are not independent components of sustainability. Instead, they form an interconnected system through which agricultural value chains can develop greater capacity to create, distribute and sustain value. Collaboration provides the relational foundation of the proposed framework. Through information sharing, resource coordination, knowledge exchange and network development, agricultural producers and other value-chain actors can potentially overcome some of the limitations associated with fragmented production and unequal access to markets and technologies. The literature on agricultural innovation, digitalization and organizational transformation supports the importance of connectivity and coordinated capabilities in contemporary agricultural systems (Galati et al., 2021; Mendes et al., 2022; Paoloni et al., 2021).

Resilience represents the adaptive dimension of sustainable value chains. Agricultural value chains must increasingly respond to technological, market, institutional and environmental uncertainty. Resilience therefore requires not only the capacity to recover from disruptions but also the ability to anticipate change, learn from experience, diversify relationships and adopt new organizational and technological practices. Digital transformation and entrepreneurship can contribute to this adaptive capacity when they are supported by appropriate organizational and institutional conditions (Burgess et al., 2023; Chen et al., 2022; Gusmanov et al., 2022; Zhang et al., 2023). Inclusive growth represents the distributional dimension of sustainability. A value chain cannot be considered fully sustainable if its economic and technological development systematically excludes smaller producers, rural entrepreneurs or other participants with limited resources. Inclusion requires access to knowledge, technology, markets, finance and opportunities for value creation. Digitalization can support this process, but only when issues of affordability, skills and institutional access are addressed (Akudugu et al., 2023; Isip, 2022; Pérez & Gómez, 2022; Pyburn et al., 2023).

The central theoretical contribution of this paper is therefore the integration of collaboration, resilience and inclusive growth into a single conceptual perspective. The framework proposes that collaborative capabilities strengthen the circulation of resources and knowledge; improved resource and knowledge flows strengthen resilience; and resilient, collaborative systems create stronger opportunities for inclusive value creation. Entrepreneurship and digital transformation operate across these relationships as enabling mechanisms. This integrated perspective extends the understanding of sustainable agricultural value chains beyond efficiency-oriented approaches and emphasizes their social, organizational and adaptive dimensions.

Future research can empirically examine the proposed relationships by developing measurable indicators of collaboration, resilience and inclusive growth and testing them across agricultural sectors, regions and institutional contexts. Comparative studies could also examine whether digital transformation produces inclusive outcomes under different levels of technological access and institutional support. Such research would help determine the conditions under which collaboration becomes a genuine source of resilience and inclusive growth rather than simply another mechanism for coordinating transactions. The conceptual framework developed here consequently provides a foundation for further theoretical development and empirical investigation of sustainable agricultural value chains in increasingly complex agricultural and agribusiness environments.

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