

Conceptualizing Sustainable Agricultural Value Chains: A Sociological Framework for Enhancing Rural Livelihoods

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Abstract

This review presents a sociological framework for sustainable agricultural value chains, emphasizing the role of social relationships, power dynamics, and community structures in shaping agricultural practices and outcomes. Recognizing that rural livelihoods are influenced not only by economic factors but also by social capital, cultural norms, and local networks, this review aims to illuminate how these social dimensions can enhance the sustainability and inclusivity of agricultural value chains. Drawing insights from Nigerian palm oil production, where community networks and traditional practices have strengthened local economies and promoted sustainable practices, the framework underscores the importance of social capital in facilitating access to resources, fostering collaboration, and creating resilience among smallholder farmers. By analyzing the lessons from Nigerian palm oil production, this review highlights the potential for similar applications in the U.S. agricultural context, where rural communities often face economic and social challenges that limit sustainable development. The proposed framework suggests that leveraging social capital through cooperatives and community-led initiatives can empower rural farmers by enhancing their market access, supporting knowledge exchange, and promoting collective action for sustainable practices. Additionally, it addresses the influence of power dynamics and social stratification on resource distribution, advocating for inclusive practices that ensure equitable participation and benefit-sharing. Future research directions include investigating how digital networks can expand social capital, exploring the role of cooperatives in fostering sustainability, and examining social stratification's impact on economic benefit distribution. This sociological approach contributes to a holistic understanding of sustainable agricultural value chains, offering pathways to strengthen rural livelihoods and support resilient, community-based agricultural systems in the U.S.

Keywords: Agricultural Value Chains, Sociological Framework, Rural Livelihoods, Review

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I. Introduction

Sustainable agricultural value chains have become a cornerstone of global efforts to improve agricultural practices and achieve economic, social, and environmental resilience (Sawicka, 2020). A sustainable agricultural value chain is one that enhances productivity and profitability while minimizing environmental impact and supporting the socio-economic well-being of farmers, workers, and local communities (Ahmed and Sallam, 2020; Sultan and El-Qassem, 2021). Such value chains include every step from production to consumption, ensuring that each link contributes to long-term sustainability. They are essential not only for maintaining biodiversity and reducing ecological footprints but also for stabilizing rural economies, where agriculture serves as the primary source of income. Building sustainable agricultural value chains can address issues like resource depletion, pollution, and economic inequities within rural areas, leading to enhanced food security and improved rural livelihoods. However, achieving sustainability in agricultural value chains requires more than just technological advancements or policy adjustments; it necessitates an understanding of the complex social relationships and power dynamics that influence agricultural practices (Manyise and Dentoni, 2021; German *et al.*, 2020).

A sociological perspective on agricultural value chains highlights how social relationships, community structures, and power dynamics shape agricultural activities (Martens and Zscheischler, 2022). Unlike purely economic or technical perspectives, a sociological approach delves into the human dimensions, such as trust, cultural practices, social norms, and networks that impact how agricultural value chains are organized and sustained. Social relationships among farmers, traders, and buyers can determine how resources are distributed, affecting access to markets and the adoption of sustainable practices. Community dynamics and collective norms

further influence cooperative behavior and the willingness to engage in eco-friendly practices, especially in small-scale farming contexts (Yin *et al.*, 2022). Power structures also play a critical role in agricultural value chains, where hierarchical relations often determined by wealth, gender, or social status can shape access to resources and decision-making processes, thus impacting the equitable distribution of benefits. By acknowledging these social factors, a sociological framework can provide valuable insights into how to promote sustainable and inclusive agricultural systems.

This review aims to develop a sociological framework that leverages social capital, cultural norms, and community networks to foster sustainable agricultural value chains. Drawing on experiences from Nigerian palm oil production, where social relationships and community structures have significantly influenced agricultural practices, the review seeks to extract lessons that could be applicable in the U.S. agricultural context. Nigerian palm oil production presents a compelling case study, as smallholder farmers in the region have long relied on community cooperation and traditional norms to sustain their livelihoods. In this setting, social capital manifested as trust, reciprocal relationships, and shared goals has proven instrumental in managing resources, accessing markets, and securing resilience against economic fluctuations. These social dynamics create a sense of shared responsibility and reinforce cultural practices that align with sustainable agricultural techniques. By analyzing the Nigerian example, this review explores how similar sociological mechanisms can be applied in U.S. agriculture to support rural livelihoods and build sustainable agricultural systems (Melchiorvand Newig, 2021).

The purpose of this review is therefore threefold. First, it examines how social capital, defined as the networks and relationships that foster trust and cooperation, can promote sustainability in agricultural practices. By building and maintaining social networks, farmers can collectively address challenges such as resource scarcity, lack of market access, and environmental vulnerabilities. Second, the review considers the role of cultural norms in guiding sustainable practices. Cultural norms influence individual and community behavior, shaping attitudes toward environmental stewardship and resource management (Gottwald and Stedman, 2020). For example, in regions where sustainable farming methods align with local customs, community members are more likely to engage in practices that conserve resources and reduce waste. Lastly, this review highlights the role of community networks and cooperative structures as means to support long-term sustainability in agriculture. Community-led initiatives, such as cooperatives, empower farmers by improving their bargaining power, reducing costs, and enhancing market access. When integrated into the broader agricultural value chain, these sociological factors can amplify the impact of sustainable practices, ensuring that agricultural development is both economically viable and socially inclusive.

By investigating these aspects, this review contributes to a broader understanding of sustainable agricultural value chains that transcend traditional economic metrics. It underscores the importance of sociological insights in shaping agricultural policies and practices, particularly in the U.S., where agriculture faces challenges such as market consolidation, environmental concerns, and rural economic disparities (Hu, 2020; Baur, 2022). The proposed sociological framework aims to provide a foundation for policies that promote inclusivity, resilience, and sustainability within agricultural communities, enhancing both productivity and quality of life for rural populations. Through this approach, the review advocates for a shift toward community-driven, socially aware agricultural systems that can adapt to the diverse needs of rural populations while contributing to a sustainable global food system.

II. Literature Review

Agricultural value chains encompass the series of activities involved in transforming raw agricultural products into goods ready for consumption (Barrett *et al.*, 2022). These chains include stages such as production, processing, and distribution, each of which contributes to value creation and impacts the livelihoods of those involved. At the production level, farmers engage in cultivating crops or raising livestock, where access to inputs such as seeds, fertilizers, and labor is critical. Processing involves transforming raw agricultural products into forms more suitable for the market, which may include packaging, quality enhancement, or preservation processes that add value and increase marketability. Distribution then ensures these processed goods reach consumers through networks that involve wholesalers, retailers, and other intermediaries (Nezamova and Olentsova, 2021). Successful agricultural value chains support economic development by increasing efficiency, enhancing product quality, and improving access to broader markets, which in turn can boost rural incomes. In sustainable agricultural value chains, emphasis is placed on environmental, social, and economic resilience. Sustainable chains aim to minimize resource consumption, reduce waste, and promote fair economic distribution among participants. Thus, achieving sustainability within agricultural value chains requires understanding the interactions among different actors and the sociological factors influencing their actions (Muflikh *et al.*, 2021). A growing body of research indicates that incorporating social considerations, such as power dynamics and local norms, into the structure of agricultural value chains can enhance their sustainability and resilience, especially in rural areas where resources are limited.

Sociological perspectives provide essential insights into how social relationships, power structures, and community norms shape agricultural practices. Key sociological concepts relevant to agricultural value chains include social capital, power dynamics, and social stratification. Social capital, often defined as the networks, trust, and shared values within a community, plays a critical role in facilitating cooperation and resource sharing among farmers (Zain *et al.*, 2022). Social capital enables farmers to access resources, such as knowledge, financial assistance, and market information, that they might otherwise lack. For example, farmers embedded in robust social networks can more easily adopt sustainable practices, as trust and reciprocity encourage collaboration and knowledge exchange. Power dynamics also significantly affect agricultural value chains, particularly in rural communities. Hierarchies within communities, often based on wealth, social status, or land ownership, can create unequal access to resources and influence decision-making processes (Redhead and Power, 2022). Those in positions of power often control critical resources and market access, which affects how benefits are distributed within the value chain. Social stratification, or the classification of individuals within society based on socioeconomic status, can further exacerbate these disparities, impacting who benefits most from agricultural activities and who remains marginalized. Understanding these dynamics is crucial for designing equitable and sustainable agricultural systems. Previous studies have explored the impact of social relationships and community structures on agricultural practices. Research has shown that farmers' connections to local networks, associations, and cooperatives can improve their resilience to economic and environmental challenges (McDaniel *et al.*, 2021). These studies indicate that when farmers work together, they can better negotiate prices, manage risks, and implement sustainable practices. For example, research on smallholder farming communities in sub-Saharan Africa has highlighted how strong social bonds and community support can mitigate challenges related to resource scarcity and market access. These findings suggest that integrating sociological insights into agricultural value chain design can enhance sustainability and rural empowerment.

Nigerian palm oil production provides a practical case for examining the role of social capital, cooperatives, and community support in fostering sustainable agricultural practices. Palm oil is a significant economic product in Nigeria, where it supports the livelihoods of millions of smallholder farmers (Ayompe *et al.*, 2021). However, the palm oil industry also faces challenges, including environmental degradation, market volatility, and resource constraints. To address these issues, many Nigerian farmers have formed cooperatives and relied on social networks for support. These cooperatives allow farmers to pool resources, share knowledge, and negotiate better prices, which can mitigate the vulnerabilities associated with individual production. Social capital is central to the success of these cooperatives. In Nigerian palm oil communities, trust and reciprocity within social networks facilitate collective action, which enables farmers to manage resources more effectively. Farmers often rely on each other for support during times of need, such as crop failures or market fluctuations. This sense of community also fosters resilience by creating a safety net that reduces individual risks and promotes group solidarity. Additionally, cultural norms and traditional practices play a role in maintaining sustainable practices. Many communities have long-held traditions of land stewardship and resource conservation that align with sustainable agricultural methods. The Nigerian palm oil case provides valuable lessons in how social structures can promote sustainability and rural empowerment (Ruml *et al.*, 2022). The collective model adopted by Nigerian palm oil farmers demonstrates how social capital and cooperative networks can reduce inequalities within agricultural value chains. Through cooperatives, smallholder farmers gain greater bargaining power, enabling them to access better markets and improve their income. The Nigerian example highlights the importance of integrating sociological considerations into agricultural development policies, as community-driven approaches can be more effective in addressing both economic and environmental challenges.

The Nigerian case underscores the need to consider social capital, cultural norms, and community networks when designing sustainable agricultural value chains in other regions, including the U.S (Ezeoha *et al.*, 2022). While the socio-economic context may differ, the principles of collective action, trust-based relationships, and community support remain applicable. In the U.S., agricultural communities face challenges related to market consolidation, environmental pressures, and economic inequities that impact rural livelihoods. By fostering community-driven initiatives, policymakers can empower rural populations to enhance resilience and achieve greater sustainability within agricultural value chains. This literature review highlights the potential of a sociologically informed approach to agricultural value chains, one that emphasizes the interconnectedness of social relationships, power dynamics, and community engagement. By examining these aspects through the Nigerian palm oil example, this review argues for a broader, more inclusive framework for sustainable agriculture, one that leverages sociological insights to create resilient and equitable systems in diverse contexts.

2.1 Developing a Sociological Framework for Sustainable Agricultural Value Chains

Creating a sociological framework for sustainable agricultural value chains involves understanding how social structures, community dynamics, and cultural factors influence agricultural practices and outcomes (Bryceson and Ross, 2020; Anibaldi *et al.*, 2021). By leveraging social capital, cultural norms, and community networks, this framework can promote sustainability in agricultural value chains, particularly in rural areas.

Social capital, defined by trust, reciprocity, and social networks, is a critical element in supporting sustainable practices in agricultural value chains (Lang *et al.*, 2022). Trust among farmers, suppliers, and buyers fosters long-term relationships that are crucial for fair trade and sustainability. When trust exists, participants are more likely to engage in transparent transactions and adhere to agreements, which benefits the entire value chain. For instance, trust within a farming community can encourage the adoption of sustainable practices, as farmers who see their peers engaging in eco-friendly methods are more likely to follow suit. Reciprocity, or the mutual exchange of resources and support, further strengthens social capital. Farmers with established relationships often share resources, such as labor, machinery, and knowledge, reducing the cost of inputs and fostering innovation. When farmers collaborate, they are also better equipped to tackle challenges like climate variability or market volatility, as the sharing of resources provides a buffer against individual risk. Social capital also facilitates efficient information exchange, particularly around sustainable practices, which may not be immediately accessible in rural settings. Networks of farmers sharing information on sustainable techniques, for example, can improve the overall resilience of agricultural systems and make resource use more efficient (Chaudhuri and Kendall, 2021).

Cultural norms and traditional knowledge form another key component of a sociologically informed framework for sustainable agricultural value chains. Many rural communities have long-standing cultural practices and environmental stewardship traditions that promote sustainability (Peng and Huang, 2022). These practices, developed over generations, are often adapted to local ecosystems and require fewer external inputs, making them inherently sustainable. Integrating traditional knowledge into modern agricultural systems requires sensitivity to cultural norms and practices. One strategy is to collaborate with local community leaders and elders who possess deep knowledge of traditional practices and ecological insights. Such collaboration can encourage the coexistence of traditional and modern techniques, enhancing sustainability while respecting cultural values. Moreover, policymakers and agricultural extension services can support these practices by documenting and validating them through research, creating a bridge between traditional knowledge and contemporary scientific understanding (Ogunyiola *et al.*, 2022; File and Nhamo, 2022). By recognizing the value of cultural norms and traditional knowledge, sustainable agricultural value chains can benefit from low-cost, ecologically sound methods that have been refined over generations.

Community networks and collective action are indispensable in promoting sustainability within agricultural value chains. Community networks, which often consist of cooperatives, farmer associations, or informal groups, empower farmers by amplifying their voices and consolidating their resources (Gargano, 2021). In many rural areas, where individual farmers may lack bargaining power, community-led organizations enable collective action, which is vital for accessing larger markets, negotiating fair prices, and securing financial and technical resources for sustainable practices. Cooperatives, for example, offer a structure for shared ownership and decision-making, allowing members to pool resources for purchasing inputs, processing products, and marketing goods. This collective approach reduces the cost per farmer, increases access to capital, and mitigates risks associated with price fluctuations or climate impacts. In addition, cooperatives create a supportive network for the adoption of sustainable practices, as they facilitate peer learning and foster a sense of responsibility toward the community's environmental resources. Community-led initiatives, such as joint investment in sustainable infrastructure or cooperative efforts to transition to organic farming, further enhance social and economic resilience (Chebrolu and Dutta, 2021). These initiatives increase adaptive capacity, as communities can collectively respond to environmental and economic challenges. For instance, a community cooperative might establish water conservation techniques that benefit all members, improving drought resilience. By fostering economic interdependence and social support, community networks create a robust foundation for sustainable agricultural practices.

A sociological framework for sustainable agricultural value chains that leverages social capital, cultural norms, and community networks offers a holistic approach to rural development. Social capital fosters collaboration and resource sharing, cultural norms provide a foundation of sustainable practices, and community networks empower collective action (Auer *et al.*, 2020). Together, these elements create resilient agricultural systems that support sustainable development and enhance rural livelihoods. By understanding and incorporating these sociological dimensions, policymakers and agricultural organizations can work toward developing agricultural value chains that not only improve productivity but also support long-term ecological balance and social equity.

2.2 Application to U.S. Agriculture

Applying a sociological framework to U.S. agriculture, inspired by insights from Nigerian agricultural practices, provides a new perspective on sustainable agricultural development and rural empowerment (Oyawole *et al.*, 2021; Uduji and Okolo-Obasi, 2022). By analyzing the dynamics of Nigerian agricultural communities and comparing them to rural U.S. counterparts, we can identify opportunities to leverage social structures such as community networks, social capital, and cultural norms to strengthen U.S. agricultural value chains.

Agricultural practices in Nigeria are often deeply embedded in community-based networks and traditional methods. Many Nigerian farmers operate within smallholder frameworks, relying on social capital, local networks, and cultural norms to facilitate resource-sharing, labor pooling, and risk mitigation (Ntumva, 2022). Community cohesion in Nigeria is also bolstered by cooperatives and informal groups, which play a significant role in improving market access, negotiating prices, and sharing agricultural knowledge. This model allows Nigerian farmers to overcome constraints associated with limited access to formal infrastructure and capital, enhancing resilience and sustainability. In contrast, U.S. agricultural practices have shifted toward highly mechanized, large-scale operations driven by market economies and technological innovation (Lewis *et al.*, 2022). U.S. farmers, particularly those operating large farms, often depend on commercial suppliers and financial institutions rather than informal community networks. While this industrial model has increased productivity and efficiency, it has also reduced the prevalence of community-centered agricultural practices, potentially leading to isolation and diminished social cohesion in rural areas. However, small to mid-sized farms in the U.S. still rely on community-based networks, indicating a potential for scaling social capital-based approaches. The implementation of community-based practices and social capital strategies in the U.S. holds promise, particularly for smaller farms facing resource and market constraints. By fostering cooperatives or other community-based organizations, rural U.S. farmers could benefit from enhanced market access, shared resources, and knowledge exchange, all of which support sustainable practices and reduce individual financial risk (Bizikova *et al.*, 2022). While Nigeria's agricultural practices rely heavily on informal social capital, U.S. farmers could adapt these strategies through formalized cooperatives, networks, and local agricultural extension programs.

Social capital, cultural norms, and networks offer valuable resources for enhancing rural livelihoods in the U.S. Adapted from the Nigerian experience, social capital can foster trust and cooperation among farmers, creating an environment where resources, information, and innovations are shared more freely (Kehinde *et al.*, 2021; Han *et al.*, 2022). For instance, local farmers' associations or cooperatives could play a role in enabling members to access group discounts for sustainable farming inputs, such as organic fertilizers or renewable energy equipment. Shared investment in sustainable practices could also lower the costs and encourage the adoption of eco-friendly methods across rural communities. U.S. rural communities also possess unique cultural norms that can support sustainability initiatives, such as valuing stewardship of the land and preserving local ecosystems. Community-driven sustainability programs that incorporate local values and heritage can have a more substantial impact, as they resonate with community members' sense of identity and responsibility toward the environment (Aktürk and Lerski, 2021; Viola, 2022). By integrating sociological insights, U.S. agricultural policy could support initiatives that build on these existing cultural values, offering incentives for practices that benefit both the environment and rural economies. Community networks in the U.S. could also be strengthened to enhance resilience and support collective action. In Nigeria, community networks play a central role in helping farmers weather economic uncertainties or environmental challenges. For U.S. agriculture, fostering stronger community networks can provide a similar buffer, particularly in rural areas affected by volatile markets or climate change (Azadi *et al.*, 2021). Developing cooperatives or supporting farmers' markets, for instance, can increase the visibility of smaller farms, provide more stable income streams, and build strong local economies. Additionally, farmers' alliances could advocate for policies that support sustainable practices and address the specific challenges facing rural communities, such as limited access to markets and high input costs.

By incorporating social capital, cultural norms, and community networks into U.S. agricultural practices, rural communities can develop more sustainable and resilient agricultural value chains (Kolade *et al.*, 2020). Adapting community-driven practices from Nigerian agriculture offers a promising path forward for U.S. farmers, particularly those who face resource constraints or market barriers. These sociological insights provide a framework for agricultural policy that prioritizes rural livelihoods, environmental stewardship, and social cohesion, ultimately contributing to a sustainable future for U.S. agriculture.

2.3 Challenges and Considerations

In developing sustainable agricultural value chains, several challenges arise related to social stratification, economic inequality, power dynamics, and ownership (Ihalainen *et al.*, 2021). These factors, rooted in social and economic structures, can influence how benefits are distributed across communities, potentially reinforcing existing inequalities. Addressing these challenges is critical to creating equitable, sustainable agricultural systems that empower rural populations and improve livelihoods.

Social stratification refers to the hierarchical arrangement of individuals and groups in a society, often leading to unequal access to resources, opportunities, and benefits. In agricultural communities, stratification can result in differentiated access to land, capital, technology, and markets (Cousins, 2022). Wealthier landowners or large-scale producers are often better positioned to access high-value markets, modern agricultural inputs, and technological advancements, allowing them to increase productivity and profitability. In contrast, smallholder farmers or those from marginalized groups may lack the resources to compete on an equal footing, limiting their economic opportunities and reinforcing poverty. This stratification creates significant risks within agricultural

value chains, as the benefits may be concentrated among the wealthier segments, while vulnerable farmers bear the majority of environmental and economic risks. For instance, in the context of contract farming, large buyers may dictate terms that favor them, such as low prices or stringent quality requirements, leaving smaller farmers with little bargaining power. Additionally, as sustainable practices often require initial investments in eco-friendly technologies or inputs, financially disadvantaged farmers may struggle to participate, resulting in an exclusionary system where only affluent players benefit from the shift toward sustainability. Mitigating these inequalities involves several strategies. Policy interventions can be used to provide subsidies or financial incentives for smallholder farmers to adopt sustainable practices, thus reducing the financial burden of transition (Havemann *et al.*, 2022). Establishing cooperatives or community-based organizations also enables farmers to pool resources, strengthen bargaining power, and access markets collectively, ensuring a more equitable distribution of benefits. Furthermore, targeted training programs and capacity-building initiatives can enhance the knowledge and skills of disadvantaged farmers, helping them to participate effectively in sustainable value chains.

Power dynamics in agricultural value chains significantly influence decision-making processes, resource allocation, and ownership structures (Klingenberg *et al.*, 2022). Often, larger stakeholders such as corporations, wealthy landowners, or government agencies hold considerable power, shaping the direction and structure of agricultural systems. This power imbalance can limit the agency of smaller farmers, preventing them from having an equal say in decisions that affect their livelihoods and well-being. For example, in value chains controlled by large corporations, smallholder farmers may have limited influence over pricing, production standards, and distribution networks, which impacts their economic stability. Addressing these power imbalances requires fostering equitable partnerships and shared ownership within agricultural communities. One approach is to promote participatory models where all stakeholders, regardless of size or capital, have a voice in decision-making. This could be achieved through cooperatives, which encourage joint decision-making and ownership among farmers, reducing reliance on external stakeholders. Community-based governance models, where local farmers have direct control over agricultural projects and resources, can also democratize power within the value chain, allowing for more inclusive decision-making processes (Macqueen *et al.*, 2020; Wilkes, 2022). Creating equitable partnerships may involve contractual arrangements that protect smallholder rights, establish fair pricing mechanisms, and ensure that benefits are distributed proportionally. For instance, in participatory value chains, smallholder farmers might receive formal recognition and legal rights, guaranteeing fair treatment and security. Additionally, policies can incentivize fair-trade practices, encouraging larger players to engage in ethical transactions that prioritize fair wages, working conditions, and environmental sustainability (Simeoni *et al.*, 2020).

Understanding the role of social stratification and power dynamics is essential to building sustainable and equitable agricultural value chains. Addressing inequalities and fostering fair partnerships through cooperatives, inclusive governance, and targeted policies can help create a system where all stakeholders benefit from sustainable practices (Jansen and Kalas, 2020; Zhu and Sun, 2020). By prioritizing fairness and shared ownership, agricultural communities can not only improve livelihoods but also strengthen social cohesion, economic resilience, and environmental stewardship.

2.4 Future Research Directions

Research on sustainable agricultural value chains can be significantly enriched by examining the roles of social networks, cooperatives, and social stratification in promoting equitable and resilient agricultural systems (Ma and Sexton, 2021; Rossi *et al.*, 2021). Addressing these areas offers insights into mechanisms for expanding market access, enhancing collective action, and ensuring fair economic distribution, all of which are critical for developing inclusive and sustainable agricultural practices.

Social networks play a crucial role in providing market access for smallholder farmers, particularly those in rural areas who may lack connections to formalized markets (Abdul-Rahaman and Abdulai, 2020). These networks, built on trust and reciprocity, often serve as conduits for knowledge-sharing, resource exchange, and collective bargaining, thus lowering barriers to entry for smallholders. Future research could explore how these networks influence market dynamics, examining both formal and informal relationships that facilitate or hinder smallholder farmers' market participation. With the increasing prevalence of digital networks and online platforms, an additional area of research is the role of digital connectivity in expanding market reach and inclusion. Digital platforms can connect rural farmers to urban and international markets, creating new opportunities for direct-to-consumer sales, fair-trade certifications, and sustainable product differentiation (Raison and Jones, 2020). Exploring how digital technologies enhance market visibility and access can reveal strategies for integrating smallholders into more lucrative markets while promoting sustainability. Investigating the potential of mobile-based networks, digital trading platforms, and online cooperatives could inform scalable solutions to reduce the digital divide and improve rural market access, thereby advancing inclusivity in agricultural value chains.

Cooperatives represent an effective model for collective action, allowing farmers to pool resources, share risks, and leverage economies of scale (Guttman, 2021). By uniting around shared goals, cooperatives can

enhance resilience and sustainability in agricultural practices, making them a valuable research focus. Future studies could examine specific cooperative structures and governance models that promote environmental sustainability while also enhancing economic outcomes for their members. For example, research might analyze how cooperatives facilitate access to green technologies, environmentally friendly inputs, and sustainable farming practices. In the U.S., investigating cooperative models tailored to the unique needs and constraints of smallholder farmers could offer insights into effective organizational frameworks (Ajates, 2020). This could include examining how cooperatives enable farmers to engage in sustainable certification programs or implement regenerative agricultural practices. Understanding these dynamics would help identify cooperative models that not only boost economic benefits but also support community-led sustainable practices, thereby improving environmental and social outcomes.

Social stratification is a powerful force that influences the distribution of benefits along agricultural value chains. Economic and social hierarchies often determine access to resources, decision-making power, and market opportunities, which can reinforce inequalities within rural communities (Popay *et al.*, 2021). Research on social stratification within agricultural value chains could reveal how various social groups such as smallholder versus large-scale farmers benefit unequally from market participation, policy support, and sustainability programs. One potential area of study is to analyze the economic distribution among farmers of different social strata, focusing on ways to mitigate unequal benefits through policy interventions or community-based initiatives. Examining how stratification affects farmers' access to sustainable resources, technical assistance, and fair markets could lead to strategies that promote inclusivity. Research could explore policy measures like targeted subsidies for marginalized farmers, fair-trade practices, or land reforms that address structural inequities, thereby creating a more equitable distribution of benefits across the agricultural value chain (Manda *et al.*, 2020; Valencia *et al.*, 2021).

Future research in these areas could deepen our understanding of how social structures, community organizations, and digital networks impact sustainable agricultural value chains (Smidt and Jokonya, 2022). Investigating the effects of social networks on market access, the role of cooperatives in resilience-building, and the impact of stratification on economic distribution provides valuable insights for designing equitable and sustainable agricultural systems. By addressing these dimensions, research can guide policy and practice toward more inclusive agricultural value chains that empower all stakeholders and enhance rural livelihoods.

Conclusion

This review has outlined a sociological framework for sustainable agricultural value chains, emphasizing the roles of social capital, cultural norms, and community networks. Key insights show that social relationships and power dynamics within agricultural communities significantly influence resource access, market reach, and the implementation of sustainable practices. Social capital, through networks of trust and reciprocity, enhances information sharing and cooperative initiatives that empower smallholder farmers and improve their resilience. Cultural norms and traditional knowledge offer valuable, context-specific strategies that can be harmonized with modern practices to promote environmental sustainability and economic stability. Meanwhile, community-led structures and collective action are instrumental in building resilience and ensuring that benefits are more equitably distributed within agricultural systems.

The proposed framework demonstrates considerable potential for fostering sustainable agricultural practices and supporting rural livelihoods. By leveraging social structures, it addresses challenges that purely economic or technical solutions often overlook, such as inequality and social exclusion. This sociological perspective also supports the formation of cooperative structures, facilitating access to resources and markets for marginalized groups, and creating a more inclusive agricultural sector.

Future research is essential to refine and apply these sociological concepts to agricultural value chains. Studies on the impact of social networks on market access, the role of cooperatives in sustainability, and the effects of social stratification on resource distribution will deepen our understanding of the framework's application. Advancing this research will support the development of policies and practices that integrate sociological insights into agricultural planning, contributing to more sustainable and equitable food systems and improved livelihoods for rural populations.

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