

Bonding, Bridging, and Linking Social Capital among Millennial Farmers in Rural Agribusiness

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(Received: 08.05.2026; Revised: 20.07.2026; Accepted: 26.07.2026)

ABSTRACT

Farmer regeneration has become a critical issue in rural agricultural development, particularly as young farmers are expected to sustain agribusiness transformation in an increasingly digital and market-oriented era. This study aims to identify the elements of social capital among millennial farmers in Keroit Village, South Minahasa Regency, and to explain how these elements shape rural agribusiness capacity. Using a qualitative-dominant design, data were collected from 24 millennial farmers through two focus group discussions, eight in-depth interviews, field observation, documentation, and a descriptive Likert-scale questionnaire. The questionnaire consisted of 25 items covering five dimensions of social capital: trust, social networks, social norms, social participation, and information access. Qualitative data were analyzed using the interactive model of data reduction, data display, and conclusion drawing, while Likert scores were used as descriptive support to triangulate the qualitative findings. The results show that trust received the highest score and was categorized as very strong, followed by social norms and social participation. In contrast, social networks and information access were categorized as moderate. These findings indicate that the social capital structure of millennial farmers in Keroit Village is dominated by bonding capital, while bridging and linking capital remain limited. The study contributes to social capital and farmer regeneration literature by showing that strong local solidarity does not automatically produce agribusiness competitiveness unless it is connected to broader markets, institutions, digital information, and innovation networks. Strengthening millennial farmers therefore requires transforming Mapalus-based cooperation into wider agribusiness capacity through partnerships, institutional assistance, digital information access, financing opportunities, and youth leadership development.

Keywords: Agribusiness; Information access; Millennial farmers; Rural development; Social capital

1. INTRODUCTION

Farmer regeneration has become one of the major challenges in agricultural development in Indonesia. The phenomenon of aging farmers has been widely discussed in global literature, indicating that the agricultural sector is experiencing a declining proportion of young workers (Food and Agriculture Organization of the United Nations [FAO], [2022](#); Organisation for Economic Co-operation and Development [OECD] & Food and Agriculture Organization of the United Nations [FAO], [2019](#)). This condition is also evident in Indonesia, including in South Minahasa Regency. According to FAO ([2022](#)), the sustainability of modern food systems depends greatly on the ability of the agricultural sector to attract younger generations, particularly in the context of agriculture that is increasingly shaped by technology, information, and innovation.

However, the success of young farmers is not determined solely by their ability to adopt agricultural technology. It is also strongly influenced by the strength of social capital, namely networks, trust, norms, and social relations that enable cooperation, information exchange, and collective decision-making (Han et al., [2022](#); Putnam, [2000](#); Woolcock, [1998](#)). In the context of rural agriculture, social capital can strengthen farmers' resilience to market risks and production uncertainty (Slijper et al., [2022](#); Woolcock, [1998](#)), accelerate the flow of agricultural information and knowledge (Hailu et al., [2025](#); Zhang et al., [2020](#)), and improve the effectiveness of farmer groups in managing resources and farming activities (Aini et al., [2024](#); Jayaraman et al., [2023](#)).

Thus, social capital functions not only as a social adhesive but also as a strategic resource that can support innovation, market access, institutional strengthening, and the sustainability of young farmers' agribusiness.

Theoretically, social capital can be understood through three main forms: bonding, bridging, and linking social capital (Woolcock, 1998). Bonding social capital refers to strong social ties among individuals or groups with close social proximity, such as family members, neighbors, fellow farmers, or local communities (Datoon et al., 2023; Muis, 2022). This form of social capital is important for building trust, solidarity, and internal cooperation. Bridging social capital refers to horizontal relationships with groups or actors outside the core community, such as cooperatives, market actors, other farmer communities, or business networks (Carolan, 2025; Nguyen & Nguyen, 2025). This form of social capital is important for expanding access to information, innovation, and economic opportunities. Meanwhile, linking social capital refers to vertical relationships with institutions that possess authority and resources, such as government agencies, agricultural extension workers, universities, financial institutions, and development organizations (Nazuri et al., 2022; Wahid et al., 2024). This form of social capital is important for opening access to policy support, training, financing, and institutional assistance.

Although studies on social capital in agriculture have been widely conducted, most existing research still focuses on conventional farmer groups or farming communities in general (Friedel & Dufays, 2023; Gaspar et al., 2025; Kustepeli et al., 2023). Studies that specifically map the configuration of social capital among millennial farmers, particularly in rural agribusiness contexts that are increasingly connected to technology, markets, and institutional networks, remain relatively limited. In fact, millennial farmers face challenges that differ from those of previous farming generations. They are not only required to maintain agricultural production but also to develop business networks, access digital information, build relationships with markets, and utilize institutional support to improve agribusiness competitiveness (Geza et al., 2021; Hutapea et al., 2025). Therefore, mapping the social capital of millennial farmers is important for understanding whether local social strengths are capable of supporting a more productive and market-oriented agricultural transformation.

In the Indonesian context, particularly in rural communities with strong traditions of mutual cooperation, social capital often appears in the form of local solidarity, family-based cooperation, and norms of mutual assistance (Humaedi et al., 2025; Samputra & Antriyandarti, 2024). However, strong bonding social capital alone is not always sufficient to promote agribusiness development if it is not accompanied by the strengthening of bridging and linking social capital (Arnott et al., 2021; Minyattah et al., 2022; Slijper et al., 2022). Strong internal ties may reinforce social cohesion, but they may also limit openness to innovation, markets, and external actors when communities depend too heavily on internal networks. Therefore, it is important to examine not only the existence of social capital but also how its structure is formed, utilized, and developed in the lives of millennial farmers.

Keroit Village, South Minahasa Regency, provides a relevant case for this study because it has an active community of young farmers, yet the social capital dynamics of this community have not been extensively mapped scientifically. On the one hand, this young farmer community has strong potential in the form of trust, solidarity, social participation, and local cooperative practices. On the other hand, they still face challenges in expanding external networks, obtaining more formal and digital agricultural information, and building relationships with agribusiness support institutions. This condition makes Keroit Village an important site for understanding how local social capital can support farmer regeneration and rural agribusiness development.

Based on this background, this study aims to identify and analyze the elements of social capital among millennial farmers in Keroit Village, South Minahasa Regency. Specifically, this study examines five dimensions of social capital: trust, social networks, social norms, social participation, and information access. In addition, this study interprets these five dimensions

within the framework of bonding, bridging, and linking social capital to understand the extent to which the social capital of millennial farmers can support the strengthening of rural agribusiness. Therefore, this study is expected to provide an empirical contribution to the literature on social capital and farmer regeneration, while also offering a basis for formulating strategies to strengthen the capacity of young farmers at the local level.

2. METHOD

This study employed a qualitative-dominant research design supported by descriptive quantitative data using a Likert-scale questionnaire. The qualitative approach was used as the main approach because this study aimed to obtain an in-depth understanding of social dynamics, relationships among farmers, cooperative practices, and the configuration of social capital among millennial farmers in Keroit Village, South Minahasa Regency. Meanwhile, the Likert-scale data were used as complementary descriptive evidence to provide an overview of respondents' perceptions of five dimensions of social capital, namely trust, social networks, social norms, social participation, and information access. Therefore, the quantitative data in this study were not used for hypothesis testing or statistical generalization, but rather to strengthen and triangulate the interpretation of the qualitative findings.

This study was conducted in Keroit Village, South Minahasa Regency. The research location was selected purposively because Keroit Village has an active community of young farmers and still maintains local cooperation practices in agricultural activities, including mutual assistance and collective work. This context was considered relevant for examining how social capital is formed, utilized, and developed by millennial farmers in supporting rural agribusiness activities.

The participants were selected using purposive sampling. In this study, millennial farmers were operationally defined as farmers aged between 19 and 39 years who were actively involved in agricultural activities, participated in farmer groups or collective farming activities, and had direct experience in social agricultural practices in Keroit Village. A total of 24 millennial farmers participated in this study. Of these participants, 16 farmers were involved in two focus group discussion sessions, with eight participants in each session, while eight farmers were selected for individual in-depth interviews. The same 24 participants also completed the Likert-scale questionnaire.

The participants consisted of young farmers with diverse agricultural backgrounds. Their ages ranged from 22 to 39 years, with farming experience ranging from two to fifteen years. Their educational backgrounds varied from junior high school, senior high school, vocational school, to university level. The commodities cultivated by the participants included horticultural crops, corn, coconut, cloves, and other seasonal food crops. Most participants were actively involved in farmer groups, collective farming activities, village agricultural programs, or informal cooperation networks among farmers. These characteristics were considered appropriate because the study focused on the social capital configuration of millennial farmers who were actively engaged in rural agribusiness activities.

Data were collected through focus group discussions, in-depth interviews, field observation, documentation, and a Likert-scale questionnaire. The focus group discussions were conducted to explore the collective views of millennial farmers regarding trust, cooperation, social norms, social networks, participation, and information access. This technique was used because FGDs are effective for exploring shared perspectives, group dynamics, and social experiences formed within a community (Krueger, 2002). Through the FGDs, the researchers obtained information on how young farmers build trust, cooperate in agricultural activities, share information, and interpret their relationships with fellow farmers and external actors.

In-depth interviews were conducted with eight selected participants to obtain a more detailed understanding of individual experiences. The interviews explored participants' personal experiences in farming, their involvement in farmer groups, their perceptions of Mapalus and

mutual assistance, their relationships with external actors, their access to agricultural information, and the challenges they faced in developing agribusiness activities. In-depth interviews were used because they allow researchers to explore individual meanings and subjective experiences more comprehensively within a particular social context (Creswell, [2015](#)).

Field observation was conducted to strengthen the data on actual social behavior among millennial farmers. The observation focused on forms of cooperation among farmers, farmer group activities, mutual assistance practices, social interactions during agricultural activities, and the use of informal and formal information channels. Through observation, the researchers were able to compare participants' statements with social practices occurring in everyday life.

Documentation was used to complement the primary data obtained through FGDs, interviews, and observation. The documents analyzed included records related to agricultural activities, farmer group activities, village social activities, and other supporting information relevant to the agricultural and social context of Keroit Village. Documentation served to strengthen the understanding of the social, institutional, and agribusiness context of the study site.

In addition to qualitative data, this study used a Likert-scale questionnaire as descriptive supporting data. The questionnaire was developed based on five dimensions of social capital: trust, social networks, social norms, social participation, and information access. The instrument consisted of 25 statement items, with five items representing each dimension. The trust dimension measured respondents' confidence in fellow farmers and local actors. The social network dimension measured the extent of farmers' relationships with internal and external actors. The social norm dimension measured the strength of mutual assistance, solidarity, and shared values. The social participation dimension measured farmers' involvement in group and community activities. The information access dimension measured the availability and use of agricultural information sources.

Examples of questionnaire items included: "I trust fellow young farmers to help when I face farming problems" for the trust dimension; "I have relationships with market actors, cooperatives, or farmer communities outside the village" for the social network dimension; "Mutual assistance remains an important norm in agricultural activities" for the social norm dimension; "I actively participate in farmer group or village agricultural activities" for the social participation dimension; and "I can access information about prices, technology, seeds, fertilizers, or government programs" for the information access dimension. Each item was measured using a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree.

The Likert-scale questionnaire was completed by all 24 participants after the qualitative data collection process. The items were developed by the researchers based on the theoretical dimensions of social capital and adjusted to the local context of millennial farmers in Keroit Village. Since the Likert-scale data served only as descriptive support, the results were not intended to represent the broader population of millennial farmers, but to help identify the general tendency of participants' perceptions and to support the qualitative interpretation.

The qualitative data were analyzed using the interactive model of Miles et al. ([2018](#)), which consists of data reduction, data display, and conclusion drawing or verification. In the data reduction stage, the researchers selected, simplified, and grouped the data obtained from FGDs, interviews, observation, and documentation. Data relevant to the five dimensions of social capital were then coded and categorized thematically. In the data display stage, the findings were organized in the form of narrative descriptions and summary tables to show the main patterns emerging from the data. In the conclusion drawing stage, the researchers interpreted the relationships among the findings and linked them to the concepts of bonding, bridging, and linking social capital.

The Likert-scale data were analyzed descriptively by calculating the mean score for each dimension of social capital. The mean scores were used to indicate respondents' perceived strength of each dimension. The score interpretation categories were determined as follows: 1.00–1.80 was categorized as very weak; 1.81–2.60 as weak; 2.61–3.40 as moderate; 3.41–4.20 as

strong; and 4.21–5.00 as very strong. These categories were used to make the Likert-scale results more transparent and comparable with the qualitative findings.

The integration of qualitative data and Likert-scale data was conducted through triangulation. Findings from FGDs, interviews, observation, documentation, and the Likert-scale questionnaire were compared to examine consistency and interconnection among data sources. For example, a high score in the trust dimension was interpreted together with FGD and interview findings on practices such as borrowing and lending farming tools, sharing pest-related information, and working together during harvest. Conversely, moderate scores in the dimensions of social networks and information access were interpreted by considering the limited relationships between young farmers and cooperatives, market actors, research institutions, agricultural extension workers, financial institutions, and other agribusiness support institutions.

Data validity was maintained through methodological triangulation and source triangulation (Creswell, 2015). Methodological triangulation was conducted by comparing data obtained through FGDs, in-depth interviews, field observation, documentation, and the Likert-scale questionnaire. Source triangulation was conducted by comparing information from different participants involved in agricultural activities and social life in Keroit Village. In this way, the researchers ensured that the findings did not depend on only one type of data or one group of informants.

Ethical considerations were addressed by obtaining participants' consent before the data collection process. Participants were given an explanation of the purpose of the study, the form of their involvement, the confidentiality of information, and their right not to answer certain questions or withdraw from the study. Participants' identities were kept confidential, and the data obtained were used only for academic purposes.

The data analysis flow in this study is presented in Figure 1.

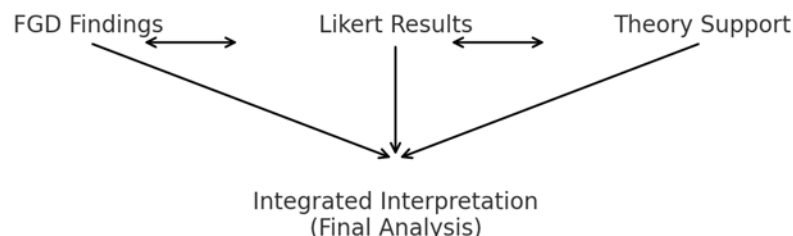


Figure 1. Analysis Flow

3. RESULTS AND DISCUSSION

Based on the results of focus group discussions (FGDs), in-depth interviews, field observation, documentation, and Likert-scale data obtained from 24 millennial farmers in Keroit Village, five main dimensions of social capital were identified: trust, social networks, social norms, social participation, and information access. These five dimensions show that the social capital of millennial farmers in Keroit Village has not developed evenly. Trust, social norms, and social participation appear as relatively strong internal resources, while social networks and

information access remain in the moderate category. This pattern indicates that the social capital structure of millennial farmers in Keroit Village is dominated by bonding social capital, whereas bridging and linking social capital are still limited.

The Likert score categories in this study were interpreted based on the following intervals: 1.00–1.80 was categorized as very weak; 1.81–2.60 as weak; 2.61–3.40 as moderate; 3.41–4.20 as strong; and 4.21–5.00 as very strong. Thus, the score for each dimension was not interpreted merely as a numerical result, but as a descriptive indicator of the tendency of social capital strength. These scores were then interpreted together with qualitative evidence from FGDs, interviews, field observation, and documentation. The summary of Likert scores and the category of each dimension is presented in Table 1.

Table 1. Social Capital Dimensions among Millennial Farmers in Keroit Village

No.	Social Capital Dimension	Likert Score	Category	Main Finding
1	Trust	4.56	Very Strong	Trust is the strongest element, reflected in mutual lending of tools, sharing pest information, and collective harvest activities.
2	Social Networks	3.21	Moderate	Internal networks are strong, but external networks with cooperatives, markets, research institutions, and other villages remain limited.
3	Social Norms	4.44	Very Strong	Mutual cooperation, solidarity, deliberation, and moral obligation to help one another remain dominant social values.
4	Social Participation	4.12	Strong	Young farmers actively participate in farmer groups, village activities, and religious or church-based social activities.
5	Information Access	3.08	Moderate	Information access is still dominated by informal channels through family and fellow farmers, while formal and digital information channels remain underdeveloped.

Table 1 shows that trust is the dimension with the highest score, followed by social norms and social participation. These three dimensions indicate strong internal ties among millennial farmers. Conversely, social networks and information access obtained lower scores, showing that young farmers' relationships with external actors, formal institutions, market channels, and digital information sources still need to be strengthened. This finding is important because the sustainability of millennial farmers' agribusiness requires not only internal solidarity but also connectivity with broader resources, innovation systems, institutional support, and markets outside the local community.

3.1 Trust

The trust dimension obtained the highest Likert score, namely 4.56, and was categorized as very strong. This indicates that relationships among millennial farmers in Keroit Village are built on a high level of interpersonal confidence. The qualitative findings from FGDs and interviews confirm that trust is expressed through daily practices such as borrowing and lending farming tools, sharing information about pests and crop conditions, helping during harvest, and working together without formal written agreements.

One participant explained:

"If one of us lacks farming tools, we usually borrow from other farmers. We already know each other, so there is no need for formal agreement. What matters is that the tools are returned and used responsibly."

(Interview, P3)

A similar view emerged in the FGD:

"When there is a pest problem, we usually tell each other immediately. We do not keep the information for ourselves because the problem can spread to other farms."

(FGD 1, Participant)

These excerpts show that trust among millennial farmers is not merely an abstract social value, but a practical resource that supports agricultural coordination. Trust enables farmers to reduce transaction costs, share risks, and respond collectively to production problems. In this context, trust functions as a foundation of bonding social capital because it is rooted in close relationships among family members, neighbors, fellow farmers, farmer groups, church communities, and local village actors.

The strength of trust in Keroit Village is also related to the Minahasan tradition of mutual assistance, locally known as Mapalus. Although Mapalus is historically embedded in local culture, the findings show that it still influences the behavior of younger farmers. Trust develops through repeated social interaction, shared agricultural experience, and moral expectations to help one another. This finding supports Putnam's (2000) argument that trust can reduce transaction costs in social and economic life. In agricultural activities, high trust makes coordination easier because farmers are less dependent on formal mechanisms when seeking assistance, borrowing tools, exchanging information, or organizing collective work.

However, the agribusiness implication of this finding must be interpreted critically. Strong trust among local farmers supports cooperation and social resilience, but it does not automatically produce broader agribusiness competitiveness. If trust remains confined within local networks, it may strengthen internal solidarity but still fail to connect farmers with markets, technology providers, financial institutions, and innovation networks. Therefore, the challenge is to transform local trust into a basis for wider collaboration with external agribusiness actors.

3.2 Social Networks

The social networks dimension obtained a score of 3.21 and was categorized as moderate. This result indicates that the internal networks of millennial farmers in Keroit Village are relatively strong, while their external networks remain limited. Young farmers maintain close relationships with family members, fellow farmers, farmer groups, church communities, and village society. However, their relationships with cooperatives, market actors, research institutions, universities, financial institutions, farmer communities outside the village, and agribusiness support institutions have not developed optimally.

One participant stated:

"We mostly communicate with farmers in this village. For selling products, many of us still depend on collectors because we do not have many direct connections to wider markets."

(Interview, P6)

Another participant added:

"We rarely communicate with cooperatives or institutions outside the village. Usually, information comes from friends, family, or people we already know."

(FGD 2, Participant)

These statements indicate that the social networks of millennial farmers are still concentrated within local and familiar circles. This condition confirms the dominance of bonding capital, but also reveals the weakness of bridging capital. Bonding capital supports solidarity and internal cooperation, but agribusiness development also requires bridging capital that connects farmers with external actors such as cooperatives, buyers, offtakers, inter-village farmer communities, and market institutions.

The limited external networks are influenced by geographical and infrastructural conditions. Keroit Village is relatively far from Motoling as the sub-district center, and narrow road access limits farmers' mobility and supporting economic activities. As a result, farmers' social networks remain concentrated within the local community, while access to broader markets,

innovation, capital, and institutional resources is still constrained.

The agribusiness implication of this finding is significant. Limited bridging capital may weaken farmers' bargaining power, reduce opportunities for collective marketing, restrict market expansion, and limit access to price information. When farmers depend heavily on collectors or informal buyers, they may have fewer opportunities to negotiate prices or diversify market channels. This finding is consistent with Xie et al. (2021), who emphasized that network expansion is important for young farmers to access innovation, capital, and markets. Zhang et al. (2020) also highlighted the importance of external networks in supporting knowledge flows and agricultural development. Therefore, strengthening millennial farmers' agribusiness requires the expansion of networks across villages, cooperatives, markets, institutions, and digital platforms.

3.3 Social Norms

The social norms dimension obtained a score of 4.44 and was categorized as very strong. This result shows that cooperation, solidarity, deliberation, and moral obligation to help one another remain the main foundation of social life among millennial farmers in Keroit Village. These norms function as informal rules that guide collective behavior, problem solving, and cooperation in agricultural activities.

One participant described the role of mutual assistance as follows:

"In our village, helping each other is common. If someone needs help during planting or harvesting, other farmers usually come. We do this because later we may also need help." (Interview, P2)

Another participant explained:

"Mapalus is still important. It is not only about working together, but also about maintaining good relations among farmers." (FGD 1, Participant)

These qualitative findings show that social norms operate as a moral and practical mechanism in agricultural life. In practice, these norms are reflected in mutual assistance during farming activities, information sharing about crop conditions, participation in village social activities, and collective decision-making. The norm of mutual assistance strengthens group cohesion and discourages highly individualistic work patterns. It also has economic value because it can reduce labor costs, accelerate work completion, and improve farming efficiency.

This finding supports Puspita (2020) and Wahid et al. (2024), who showed that collective norms can function as informal social control mechanisms in agricultural communities. Social norms help ensure that group members remain involved, support one another, and comply with values considered important by the community. However, strong social norms also need to be developed adaptively. Local norms such as Mapalus should not only be preserved as cultural practices, but also transformed into productive agribusiness cooperation.

From an agribusiness perspective, Mapalus can be directed toward collective input procurement, post-harvest processing, joint marketing, group savings, shared use of agricultural tools, and collective responses to production risks. Without such transformation, strong social norms may remain socially valuable but economically underutilized. Therefore, the key issue is not whether local norms exist, but how these norms can be strategically organized to support agribusiness competitiveness.

3.4 Social Participation

The social participation dimension obtained a score of 4.12 and was categorized as strong. This finding indicates that young farmers in Keroit Village are actively involved in farmer groups, collective activities, village activities, and religious or church-based social activities. This participation shows that millennial farmers are not detached from village social life, but remain actively embedded in community-based networks.

One participant stated:

"We often join farmer group activities, especially when there is collective work or village agricultural activity. Participation is important because we can exchange information and help

each

other.”

(Interview, P5)

Another participant explained:

“Young farmers are usually involved not only in farming activities, but also in church and village activities. From there, we also build relationships with other people.”
(FGD 2, Participant)

These statements show that social participation functions as a mechanism for maintaining relationships, exchanging information, and strengthening collective identity. Strong participation is closely related to high trust and strong social norms. When young farmers trust one another and share norms that encourage cooperation, they are more likely to participate in collective activities. Social participation also expands local information exchange and builds a sense of belonging to the group and community.

Aini et al. (2024) explained that participation is an important predictor of the development of horticultural farming enterprises and other agricultural activities. This is consistent with the findings in Keroit Village, where young farmers who are active in group activities have greater opportunities to obtain information, build trust, and engage in agricultural cooperation. Strong norms and trust serve as the main drivers of participation (Putnam, 2000).

However, social participation in Keroit Village still appears to be concentrated mainly in local and community-based activities. From an agribusiness perspective, this participation needs to be expanded into more strategic forms, such as participation in training programs, market negotiations, cooperative development, digital marketing initiatives, business partnerships, financial literacy programs, and institutional forums. Without this expansion, participation may strengthen local cohesion but may not sufficiently improve farmers’ access to wider economic opportunities.

3.5 Information Access

The information access dimension obtained a score of 3.08 and was categorized as moderate. This dimension is one of the aspects that most needs to be strengthened in the social capital structure of millennial farmers in Keroit Village. The findings show that information access is still dominated by informal channels, especially family members, fellow farmers, neighbors, and local experience. Information about pests, fertilizers, seeds, prices, and cultivation practices is more often obtained through conversations among farmers than through formal or digital channels.

One participant stated:

“Most agricultural information comes from fellow farmers or family. If someone has tried a fertilizer or seed, then others will ask whether it works or not.”
(Interview, P4)

Another participant explained:

“We use mobile phones, but not all farmers know where to find reliable agricultural information. Sometimes we just follow what other farmers say.”
(FGD 2, Participant)

These findings indicate that agricultural information is not yet fully connected to broader sources of knowledge. Informal channels are useful because they are easy to access, trusted, and suitable for the local context. However, dependence on informal information may limit farmers’ access to accurate, up-to-date, and market-oriented knowledge. Information about modern agricultural technology, financing opportunities, supply chains, market prices, pest management, government programs, and post-harvest innovation requires broader access through extension workers, agricultural institutions, digital markets, universities, and agricultural information platforms.

The moderate score of information access reflects the limited development of bridging and linking capital. Limited bridging capital reduces the flow of information from market actors, other farmer communities, and agribusiness networks. Limited linking capital reduces access to information from institutions with formal authority and resources, such as government agencies,

extension workers, financial institutions, universities, and development organizations.

The agribusiness implications are substantial. Weak access to information can reduce farmers' ability to compare prices, adopt appropriate technologies, access government programs, improve product quality, and respond to market demand. In the digital era, information asymmetry can place small farmers in a weaker bargaining position. Wolfert et al. (2017) emphasized that information access plays a strategic role in agricultural transformation. Therefore, strengthening information access should become a priority through WhatsApp groups, village social media, agricultural applications, price information systems, digital mentoring by extension workers, and collaboration with university partners.

3.6 Synthesis of the Social Capital Structure

The analysis of the five dimensions shows that the social capital structure of millennial farmers in Keroit Village is bonding-dominant. Trust, social norms, and social participation obtained high scores because they are supported by social closeness, mutual assistance, and strong community relations. Conversely, social networks and information access obtained moderate scores because relationships with external actors, formal institutions, markets, and digital information sources remain limited.

The relationship between the five dimensions of social capital and the forms of bonding, bridging, and linking capital is summarized in Table 2.

Table 2. Synthesis of Social Capital Structure among Millennial Farmers in Keroit Village

Social Capital Dimension	Dominant Form of Social Capital	Qualitative Evidence	Agribusiness Implication
Trust	Bonding capital	Mutual lending of tools, helping during harvest, sharing pest information, and strong interpersonal confidence among local farmers	Supports coordination, reduces transaction costs, and strengthens collective farming practices
Social Norms	Bonding capital	Mapalus, mutual assistance, solidarity, deliberation, and moral obligation to help one another	Can be transformed into collective input procurement, labor rotation, joint marketing, and group-based agribusiness cooperation
Social Participation	Bonding capital with potential bridging function	Active involvement in farmer groups, village activities, and church-based social activities	Strengthens local cohesion but needs to be expanded into training, partnerships, market forums, and cooperative development
Social Networks	Bridging capital, still limited	Strong local networks but weak relationships with cooperatives, market actors, farmer communities outside the village, and agribusiness institutions	Limits bargaining power, market expansion, collective marketing, and access to innovation
Information Access	Bridging and linking capital, still limited	Information remains dominated by family, fellow farmers, and informal conversations; formal and digital channels are underdeveloped	Limits access to price information, technology, financing, government programs, and institutional support
Institutional Relationships	Linking capital, still limited	Limited interaction with extension workers, government agencies, universities, financial institutions, and development organizations	Reduces access to training, capital assistance, technology adoption, policy support, and institutional mentoring

Table 2 clarifies that the strength of social capital among millennial farmers lies mainly in bonding capital. This form of social capital is important because it strengthens trust, solidarity, reciprocity, and local cooperation. However, the findings also show that strong bonding capital does not automatically generate agribusiness competitiveness. Millennial farmers still require bridging capital to connect with market actors, cooperatives, inter-village farmer communities, and business networks. They also require linking capital to access government support, extension services, financing, universities, and development institutions.

This synthesis provides the main analytical contribution of the study. The case of Keroit Village shows that the central problem is not the absence of social capital, but the uneven configuration of social capital. Strong local solidarity has not yet been sufficiently transformed into broader agribusiness capacity. Therefore, farmer regeneration should not be understood only as the involvement of young people in farming, but also as the development of young farmers' ability to mobilize networks, information, institutions, and markets.

3.7 Social Engineering Model for Strengthening Millennial Farmers' Agribusiness

Based on the synthesis above, this study proposes a preliminary Social Engineering Model for strengthening millennial farmers' agribusiness. This model was derived from the empirical findings of the study, particularly the strong presence of bonding capital and the limited development of bridging and linking capital. However, this model should be understood as a preliminary conceptual intervention framework, not as a model that has been empirically tested or validated through program implementation.

The proposed model is designed to preserve local social capital while expanding young farmers' connections with external actors, institutions, and resources. It consists of five main components.

The first component is strengthening bonding capital through agribusiness-based Mapalus. Mapalus needs to be directed into productive cooperation schemes that support agribusiness, such as labor rotation during harvest, group savings, collective input procurement, shared use of agricultural tools, and cooperation in solving production problems. This component is based on the high scores of trust and social norms, which indicate that young farmers already have a strong foundation of solidarity for economic cooperation.

The second component is expanding bridging capital through partnerships. Bridging capital can be expanded by building networks with local MSMEs, cooperatives, collectors, offtakers, market actors, and young farmer communities across villages. This component responds to the moderate score of social networks. Through partnerships, young farmers can gain broader market access, price information, collaboration opportunities, product development support, and agribusiness experience from actors outside the local community.

The third component is strengthening linking capital with external institutions. Linking capital can be strengthened through assistance from agricultural extension workers, relationships with the Department of Agriculture, access to People's Business Credit or KUR, and training from universities, NGOs, or development institutions. This component is important because young farmers need institutional support to improve their technical, managerial, financial, and organizational capacity.

The fourth component is establishing a village agribusiness information center. This center can provide information on prices, pests, technology, financing, training, government programs, and market opportunities. Information can be disseminated through WhatsApp groups, village social media, village information boards, agricultural applications, and digital mentoring by extension workers or university partners. This component directly responds to the moderate score of information access.

The fifth component is developing a Farm Youth Leadership Program. A young farmer leadership program is needed to create local actors who are capable of driving agricultural transformation. This program may include training in business management, digital literacy, negotiation, financial recording, public communication, cooperative management, and policy

advocacy. Farmer regeneration requires not only young labor, but also young leaders who can connect local values with the needs of modern agribusiness.

The proposed Social Engineering Model is relevant to broader rural development agendas because it seeks to connect local solidarity with agribusiness transformation. Nevertheless, because the model has not yet been tested, future studies and community-based programs should validate it through stakeholder consultation, pilot implementation, participatory evaluation, and comparative application in other villages. In this way, the model can be developed into a more operational intervention strategy for strengthening the capacity of millennial farmers at the village level.

Overall, the findings of this study provide a contextual understanding of the social capital structure among millennial farmers in Keroit Village. Strong bonding capital serves as an important foundation for trust, solidarity, and collective action within the local farming community. However, the limited development of bridging and linking capital restricts young farmers' access to broader markets, technology, financing, institutional support, and digital information. Therefore, strengthening millennial farmers should not rely solely on technical training or production assistance, but should also address the social capital structure that shapes farmers' capacity to cooperate, access information, build partnerships, and engage with institutions.

These findings should be interpreted within the specific context of Keroit Village. Since the study was conducted in a single village, the results are better understood as context-specific insights rather than generalizable conclusions for all millennial farmers in Indonesia. In addition, the Likert-scale data were used descriptively to support the qualitative findings and were not intended to test causal relationships among variables. Some findings were also based on participants' perceptions, which may contain social desirability bias, particularly because trust, solidarity, and participation are commonly regarded as positive values in rural communities.

Despite these limitations, the study contributes to the literature on social capital and farmer regeneration by showing that strong local bonding capital does not automatically produce agribusiness competitiveness unless it is connected to bridging and linking capital. In many rural agricultural communities, internal solidarity may be strong, but access to markets, institutions, digital information, and innovation remains limited. Therefore, the development of millennial farmers in Keroit Village should be directed toward transforming local social capital into a more productive, open, and sustainable agribusiness capacity through agribusiness-based Mapalus, strategic partnerships, digital agricultural information access, institutional mentoring, and youth leadership development.

4. CONCLUSIONS AND SUGGESTION

This study concludes that the social capital of millennial farmers in Keroit Village is characterized by an uneven configuration, in which bonding social capital is strong while bridging and linking social capital remain limited. Trust, social norms, and social participation constitute the main social foundations that sustain mutual assistance, Mapalus-based cooperation, and collective agricultural practices. However, the moderate level of social networks and information access indicates that young farmers still face structural constraints in connecting with broader markets, formal institutions, digital information systems, financial resources, and agribusiness support networks. These findings suggest that strong local solidarity does not automatically lead to agribusiness competitiveness unless it is transformed into wider external connectivity and institutional capacity. Therefore, strengthening millennial farmers requires an integrated strategy that preserves local values while expanding partnerships, institutional support, digital information access, financing opportunities, and youth leadership. The proposed Social Engineering Model should be understood as an initial conceptual framework that requires further empirical validation. Future research is recommended to test this model through pilot programs, compare social capital configurations across different villages, and examine how digital platforms

can strengthen bridging and linking capital among young farmers. In this way, social capital can function not only as a basis for community cohesion, but also as a strategic resource for building sustainable, adaptive, and competitive rural agribusiness.

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