

The Role of Social Capital in the Empowerment of Beef Cattle Farming Groups: A Case Study in North Minahasa Regency, Indonesia

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Abstract

This study explores the relationship between social capital and the empowerment of beef cattle farming groups in North Minahasa Regency, Indonesia. The main objective is to examine how elements of social capital—particularly trust, proactive behavior, and shared norms—contribute to empowerment indicators such as accountability, access to information, and organizational capacity. A quantitative cross-sectional research design was employed, using structured questionnaires distributed to 30 randomly selected members of active beef cattle farming groups. The data were analyzed using descriptive statistics and Spearman Rank Correlation to measure relationships between social capital variables and empowerment indicators. Qualitative insights from interviews and observations were used to enrich and contextualize the quantitative findings. Results show that proactive action is strongly correlated with access to information ($r = 0.854$), trust is strongly linked to accountability ($r = 0.837$), and social norms are closely associated with group responsibility ($r = 0.775$). These findings suggest that internal social cohesion enhances governance, information-sharing, and collective performance. However, weaknesses in external networking and overdependence on informal structures may limit adaptability and long-term sustainability. The study proposes a three-part policy model: (1) trust-building mechanisms to enhance group accountability, (2) network enhancement strategies to strengthen external linkages, and (3) norm formalization to support internal governance. This model is tailored to the cultural and institutional context of North Minahasa and offers practical pathways for rural empowerment. This research contributes original insight by empirically linking specific social capital dimensions to empowerment in livestock systems, providing a contextualized framework that integrates socio-cultural dynamics with agricultural policy.

Keywords: Cattle Farming Policy; Social Capital; Economic Development; Sustainable Development.

Abstrak

Penelitian ini mengeksplorasi hubungan antara modal sosial dan pemberdayaan kelompok peternak sapi potong di Kabupaten Minahasa Utara, Indonesia. Tujuan utama dari studi ini adalah untuk mengkaji bagaimana elemen-elemen modal sosial—khususnya kepercayaan, perilaku proaktif, dan norma bersama—berkontribusi terhadap indikator pemberdayaan seperti akuntabilitas, akses terhadap informasi, dan kapasitas organisasi. Desain penelitian yang digunakan adalah kuantitatif dengan pendekatan potong lintang (cross-sectional), melalui penyebaran kuesioner terstruktur kepada 30 anggota kelompok peternak sapi potong aktif yang dipilih secara acak. Data dianalisis menggunakan statistik deskriptif dan Korelasi Rank Spearman untuk mengukur hubungan antara variabel modal sosial dan indikator pemberdayaan. Wawancara dan observasi digunakan sebagai data kualitatif untuk memperkaya dan memberi konteks pada temuan kuantitatif. Hasil penelitian menunjukkan bahwa tindakan proaktif memiliki korelasi kuat dengan akses informasi ($r = 0.854$), kepercayaan berkorelasi kuat dengan akuntabilitas ($r = 0.837$), dan norma sosial memiliki keterkaitan yang erat dengan tanggung jawab kelompok ($r = 0.775$). Temuan ini menunjukkan bahwa kohesi sosial internal dapat meningkatkan tata kelola, berbagi informasi, dan kinerja kolektif. Namun demikian, kelemahan dalam jaringan eksternal dan ketergantungan berlebihan pada struktur informal dapat membatasi kapasitas adaptif dan keberlanjutan jangka panjang. Studi ini mengusulkan model kebijakan tiga pilar: (1) mekanisme pembentukan

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kepercayaan untuk meningkatkan akuntabilitas kelompok, (2) strategi penguatan jejaring untuk memperluas keterhubungan eksternal, dan (3) formalitas norma untuk mendukung tata kelola internal. Model ini disesuaikan dengan konteks budaya dan kelembagaan di Minahasa Utara, serta menawarkan jalur praktis untuk pemberdayaan pedesaan. Penelitian ini memberikan kontribusi orisinal dengan secara empiris menghubungkan dimensi modal sosial tertentu dengan pemberdayaan dalam sistem peternakan, serta menyediakan kerangka kerja kontekstual yang mengintegrasikan dinamika sosial budaya dengan kebijakan pertanian.

Kata Kunci: Kebijakan Peternakan Sapi; Modal Sosial; Pembangunan Ekonomi; Pembangunan Berkelanjutan.

INTRODUCTION

Livestock development in Indonesia is becoming increasingly strategic as the demand for animal-based protein rises rapidly due to population growth, rising income levels, and growing public awareness of nutritious food consumption (Anari, Suryahadi, & Pandjaitan, 2019). Among livestock commodities, beef remains central, with annual per capita consumption reaching 2.7 kg in 2022—a 15% increase from 2018—while domestic production has only met about 65% of total demand (Kurniawan, Santoso, Fenita, Badarina, & Nurmeiliasari, 2024). This persistent supply gap compels Indonesia to import approximately 230,000 tons of beef annually, which not only exacerbates trade deficits but also increases the nation's vulnerability to global price fluctuations and market dependency.

The dominance of smallholder-based cattle farming—accounting for 85–90% of national production (Zhao, Song, & Xu, 2013)—presents both a challenge and an opportunity. These farmers often operate under structural limitations such as low access to capital, minimal technology adoption, and inadequate management skills (Satriya & Indrayani, 2023). Consequently, their production capacity remains inefficient and economically vulnerable. The continued preference for imported beef, which is often regarded as superior in tenderness and consistency (Yulianti, Priyanto, & Nuraini, 2023), also places downward pressure on the competitiveness of local cattle farming.

Beyond the economic implications, this situation also presents significant social and cultural consequences. The marginalization of traditional smallholder cattle systems risks eroding generational knowledge, weakening local food sovereignty, and increasing socio-economic disparities in rural areas. As emphasized by the Directorate General of Animal Husbandry (Pandey, Lainawa, & Warouw, 2024), empowering these smallholder groups is crucial not just for production goals but also for strengthening the socio-cultural fabric of rural communities. In regions such as North Minahasa Regency, where cattle farming is historically embedded within community practices, these dynamics are especially pronounced.

Given these conditions, there is an urgent need for deeper academic inquiry and policy innovation that integrates socio-cultural assets—such as social capital—into livestock development strategies. This study responds to that need by exploring how various elements of social capital influence the empowerment of beef cattle farming groups in North Minahasa. The goal is to provide a culturally contextualised, evidence-based framework that can inform more equitable and sustainable livestock development policies in similar rural settings.

Prior studies on farmer group dynamics and empowerment through social capital can be categorized into three major thematic areas: (1) the role of trust in facilitating cooperation, (2) accountability mechanisms in farmer organizations, and (3) the influence of social norms on cooperative behavior. First, research by Qurniati et al. (2017), Aoyagi et al. (2022), and Barraud-Didier et al. (2012) emphasized the centrality of trust in enhancing collaboration and reducing uncertainty among farming

communities. However, these studies often treat trust as a general construct without quantifying its relationship to specific empowerment outcomes such as accountability or information access. Second, studies on accountability in farmer groups (Singh, Singh, & Dubey, 2023; Zawojska, 2010), show that transparency and participatory governance structures significantly influence organizational effectiveness. Yet, few of these investigations explore how social capital dimensions like proactive behavior or informal leadership contribute to accountability within semi-formal rural groups. Third, the literature on social norms—such as work by Gross & Vostroknutov (2022), Cui et al. (2023), and House et al. (2020)—underscores their importance in shaping cooperative actions through internalization and group identity. Nevertheless, these studies are typically situated within behavioral economics or social psychology and lack direct application to agricultural or livestock contexts. Overall, while the importance of trust, accountability, and norms has been individually established, there remains a critical gap in integrated, empirical studies that link these elements within the context of smallholder beef cattle farming in Indonesia. This research addresses that gap by quantifying the correlations between key social capital variables and empowerment dimensions, offering a context-specific model grounded in North Minahasa's unique cultural and institutional landscape.

This research aims to develop a comprehensive and contextually-appropriate policy model for beef cattle farming businesses that strategically leverages social capital dynamics in North Minahasa Regency. Through rigorous empirical investigation and systematic analysis, the study seeks to achieve three interconnected objectives. First, the research will analyze the current levels, characteristics, and distinguishing features of social capital among beef cattle farming groups in North Minahasa district, examining variations in trust formation processes, network structures, and normative frameworks across different group configurations and operational contexts. Second, the study will assess quantitative and qualitative relationships between specific social capital elements (trust mechanisms, network configurations, and shared normative structures) and multiple dimensions of empowerment among beef cattle farming groups, including operational effectiveness, innovation adoption patterns, market access capabilities, resource mobilization efficiency, and sustainable management practices. Third, based on empirical findings and theoretical insights, the research will formulate evidence-based policy recommendations that systematically incorporate social capital considerations for sustainable beef cattle farming development in the region, addressing both immediate productivity constraints and long-term sustainability challenges while respecting traditional knowledge systems and local institutional arrangements.

The central hypothesis guiding this research posits that significant and measurable relationships exist between social capital elements and multiple performance indicators of beef cattle farming businesses in North Minahasa district. The null hypothesis (H0) states there is no statistically significant relationship between social capital components (trust levels, network density, and normative coherence) and key beef cattle farming business success metrics (productivity rates, adaptation capacity, market integration, and sustainability practices). Conversely, the alternative hypothesis (H1) proposes that trust formation mechanisms, network configuration patterns, and shared normative frameworks positively correlate with enhanced productivity outcomes, accelerated innovation adoption processes, improved market access capabilities, and more sustainable resource management practices among beef cattle farming groups in the region. This research will employ mixed-method approaches to systematically evaluate these competing hypotheses, generating both quantitative measurements and qualitative insights regarding the complex relationships between social capital dimensions and farming group

performance indicators, thereby informing more effective policy interventions that acknowledge social dynamics alongside technical and economic considerations.

RESEARCH METHODS

This research focused on beef cattle farmers who are members of active farmer groups in North Minahasa district as the primary unit of analysis. The study specifically targeted individual farmers within these groups to examine how social capital elements influence their empowerment and business development. This unit of analysis was selected because these farmers represent the backbone of the beef cattle production system in the region, accounting for approximately 85-90% of local production, and their collective social dynamics directly impact productivity outcomes. The research examined their participation patterns, trust relationships, adherence to social norms, value systems, and proactive behaviors as components of social capital, as well as their access to information, participation levels, accountability practices, and organizational capacity as indicators of empowerment.

This study employed a quantitative research design using cross-sectional survey methodology complemented by direct observation and documentation techniques. A quantitative correlational approach was selected to objectively measure the relationship between social capital variables (X) and empowerment indicators (Y) within beef cattle farming groups. The survey method was specifically chosen to systematically collect standardized data that would allow for statistical analysis and hypothesis testing regarding the influence or relationship between research variables. The cross-sectional approach, collecting data between June and October 2024, was deemed appropriate due to resource constraints and the need to capture current conditions within farming groups without requiring long-term monitoring. Direct observation was incorporated to validate self-reported survey data and capture behavioral dynamics not readily accessible through questionnaires, while documentation techniques provided historical context and verification of group activities and achievements.

The research drew on multiple data sources to ensure comprehensive coverage and triangulation. Primary data sources included 30 individual beef cattle farmers selected through proportional random sampling from three active farmer groups in North Minahasa district. This sampling approach accounted for population strata in each beef cattle farming group, addressing the non-homogeneous distribution of members across groups. The total population comprised 83 farmers, with the sample size of 30 respondents determined based on statistical considerations including population heterogeneity, a desired confidence level of 95%, and acceptable margin of error, meeting minimum requirements for parametric statistical analysis as recommended by (Anshory, Dewi, & Furnamasari, 2021). Secondary data sources included group meeting minutes, activity reports, and local government livestock development records, which provided contextual information about group formation, development trajectories, and institutional support mechanisms. Additional reference sources included regional livestock statistics, market reports, and previous studies on beef cattle farming in North Sulawesi province.

Data collection employed multiple techniques to ensure validity and comprehensiveness. Structured questionnaires served as the primary data collection instrument, designed with 5-point Likert scale items measuring respondents' agreement levels with statements related to social capital indicators (participation in social networks, exchange of kindness, trust, social norms, social values, and proactive action) and empowerment indicators (access to information, involvement/participation, accountability, and local organizational capacity). The questionnaire underwent pilot testing with five farmers not included in the final sample to ensure clarity and reliability. Semi-structured interviews were conducted with group leaders and selected members to obtain deeper insights into group dynamics and challenges.

Field observation utilized standardized observation sheets to document group meetings, collective activities, and member interactions during a two-month period. Documentation review employed content analysis templates to systematically extract relevant information from group records, local government reports, and previous meeting minutes. All data collection activities adhered to research ethics principles, with informed consent obtained from all participants and confidentiality of personal information maintained throughout the research process.

The data analysis process followed a systematic approach appropriate for the research objectives and data characteristics. Quantitative descriptive analysis was first conducted to summarize the social capital and empowerment profiles of beef cattle farming groups based on Likert scale responses. This included calculating frequency distributions, central tendency measures (mean, median, mode), and dispersion indicators (standard deviation, variance) for each variable and indicator. To examine the relationship between social capital and the empowerment of beef cattle farming groups, Spearman Rank Correlation analysis was applied. This non-parametric test was selected due to its appropriateness for ordinal data derived from Likert scales and its robustness against violations of normality assumptions. The strength of relationships was interpreted using de Vaus's 2002 correlation coefficient guidelines, where coefficients of 0.00 indicate no connection, 0.01-0.09 represent less meaningful relationships, 0.10-0.29 suggest weak links, 0.30-0.49 indicate moderate relationships, 0.50-0.69 show strong relationships, 0.70-0.89 represent very strong relationships, and 0.90-0.99 suggest near perfect correlations. Hypothesis testing employed a significance level of $\alpha = 0.05$, rejecting H_0 when the significance value was less than 0.05, thereby accepting H_1 which stated that social capital has a significant relationship with the empowerment of beef cattle farming groups in North Minahasa district. Qualitative data from observations and interviews were analyzed thematically to provide context and deeper explanation for the quantitative findings, enhancing the overall interpretation of results. The variables and their respective indicators are presented in Tables 1 and 2.

Table 1. Variables and indicators of social capital used

Variables	Elements of Social Capital	Indicator
Social capital (X)	Participation in social networks (X1.1)	1.1 Voluntary 1.2 Equality 1.3 Civility
	Exchange of kindness (X1.2)	2.1 Level of social concern 2.2 Attitude of helping each other
	Trust (X1.3)	3.1 Individual level 3.2 Levels of social relations 3.3 Levels of social system
	Social norms (X1.4)	4.1 Formal norms 4.2 Non-formal norms
	Social values (X1.5)	5.1 Competition value 5.2 The value of honesty
	Proactive action (X1.6)	6.1 Initiative 6.2 Informative

Table 2. Variables and indicators of the empowerment of beef cattle farming groups used

Variables	Elements of Culture	Indicator
Empowerment (Y)	1. Access to Information (Y1.1)	1.1 Opportunity 1.2 Service 1.3 Responsibility for the accuracy of information
	2. Involvement/participation (Y1.2)	2.1 Who is involved? 2.2 How they got involved
	3. Accountability (Y1.3)	3.1 Activity executor 3.2 Responsibility for activities
	4. Local organizational capacity (Y1.4)	4.1 Ability to work together 4.2 Ability to organize citizens 4.3 Mobilization of resources in problem solving

The relationship between social capital and the empowerment of beef cattle farming groups was analyzed using the Spearman Rank Correlation method. This non-parametric test was selected due to its appropriateness for ordinal data derived from Likert scales. To interpret the strength of relationship between variable X and variable Y, the correlation coefficient interpretation guidelines proposed by de Vaus (2002) were utilized, as presented in Table 3.

Table 3. Interpretation of Correlation Coefficient

Coefficient	The Power of Relationships
0.00	No connection
0.01-0.09	Less Meaningful Relationship
0.10-0.29	Weak Link
0.30-0.49	Moderate Relationship
0.50-0.69	Strong Relationship
0.70-0.89	Very Strong Relationship
0.90-0.99	Near Perfect

Source: de Vaus (2002)

For hypothesis testing, statistical significance was established at $\alpha = 0.05$. If the significance value $< \alpha (0.05)$, then H_0 is rejected and H_1 is accepted, which means that social capital has a relationship with the empowerment of beef cattle farming groups in North Minahasa district, and vice versa.

RESULTS AND DISCUSSION

Level of Social Capital in Beef Cattle Farming Groups in North Minahasa Regency

The present study examined the level of social capital among beef cattle farming groups in North Minahasa Regency. These groups, which operate primarily through traditional practices passed down through generations, serve as the backbone of local livestock production. Data were collected using a structured questionnaire with a 5-point Likert scale to measure six key elements of social capital:

participation in social networks, exchange of kindness, trust, social norms, social values, and proactive action.

Survey results revealed variation in the strength of these elements across the farmer groups. The element of trust achieved the highest average score of 4.2, classified as very high, indicating strong mutual confidence among group members. This was followed by social norms (3.9) and proactive action (3.8), both categorized as high. Social values and exchange of kindness scored 3.7 and 3.5, respectively, falling within the high to moderate range. The lowest score was observed in participation in social networks, which received an average score of 3.1, categorized as moderate.

The average scores for each element of social capital measured in this study are summarised in Table 4. These values provide a quantitative overview of the levels of trust, social norms, proactive action, social values, exchange of kindness, and participation in social networks among beef cattle farming groups in North Minahasa Regency. The table helps highlight which elements are most dominant and which may require further development in terms of social engagement and collaboration.

Table 4. Average Scores of Social Capital Elements in Beef Cattle Farming Groups

Social Capital Element	Average Score (Scale 1-5)	Category
Trust	4.2	Very High
Social Norms	3.9	High
Proactive Action	3.8	High
Social Values	3.7	High
Exchange of Kindness	3.5	Moderate
Participation in Social Networks	3.1	Moderate

Source: Processed primary data, 2024

The data in Table 4 shows that trust is the strongest aspect of social capital among the beef cattle farming groups, meaning that farmers generally have high confidence in one another. Other strong elements include social norms and proactive action, which suggest that group members tend to follow agreed-upon rules and take initiative in group activities. Meanwhile, aspects like social values and exchange of kindness are still present but not as strong. The lowest score is found in participation in social networks, indicating that these groups have fewer connections or collaborations with people or institutions outside their immediate community.

The data reveals several key patterns in the social capital of beef cattle farming groups in North Minahasa. The high scores for trust (4.2/5) and social norms (3.9/5) suggest a strong foundation of mutual confidence and shared expectations, which help sustain cooperation and rule-following behaviour within the group. The relatively high level of proactive action (3.8/5) shows that members are willing to take initiative, although this initiative remains largely internal and does not extend to building broader connections. Meanwhile, the moderate score for exchange of kindness (3.5/5) indicates that acts of mutual support are present but not yet deeply embedded as a group-wide culture. The consistently low score in participation in social networks (3.1/5) highlights a gap in external engagement, suggesting that while

internal relationships are strong, there is a need to expand connections with outside institutions or other farming communities. These patterns point to a social structure that is cohesive but inward-looking, with potential for further development in outreach and collaboration.

The high level of trust observed among farming groups is particularly significant for collaborative livestock management. According to Coleman's (1988) social capital theory, trust serves as a fundamental resource that facilitates cooperation and reduces transaction costs in group activities. The strong presence of trust enables group members to engage in collective actions such as shared grazing arrangements and labor exchange without formal contracts or external enforcement mechanisms. The relatively weak participation in social networks indicates that while internal social capital is robust, these farming groups may have limited access to external resources, information, and opportunities. This finding aligns with Woolcock's (1998) distinction between bonding and bridging social capital, suggesting that these groups possess strong bonding capital (internal connections) but weaker bridging capital (external networks). This imbalance may limit their ability to access new markets, technologies, and knowledge beyond their immediate community.

These results are consistent with a growing body of literature highlighting trust as a key enabler of collective action in rural farming communities. Studies have shown that trust significantly improves group governance, participation, and performance in agricultural cooperatives and producer organisations (Bernard et al., 2021; Tadesse & Kassie, 2017). In contexts similar to North Minahasa, trust enables farmers to collaborate on resource management, marketing, and innovation, often in the absence of formal institutional support (Qurniati et al., 2017; Siczko, Parzonko, & Siczko, 2021). Moreover, the internal cohesion found in these groups aligns with bonding social capital, which fosters resilience and shared norms at the local level (Gong, Li, Parks, Pang, & de Fraiture, 2018; Xu, Liang, & Huang, 2018). However, the relatively low participation in broader social networks suggests weak bridging social capital, which limits access to new markets, technological advancements, and policy support—elements increasingly critical for modern agricultural development (Levy & Lubell, 2018; Sørensen, 2016). The imbalance between strong internal trust and weak external linkages indicates that while traditional forms of social capital remain vital, future sustainability depends on strategies that also cultivate bridging ties to external actors and institutions. Thus, policies aimed at reinforcing both types of social capital are necessary to strengthen collective capacities and ensure long-term rural development outcomes.

The Relationship Between Social Capital and Empowerment of Beef Cattle Farming Groups

This section presents the results of statistical analysis examining the correlation between elements of social capital (X) and various dimensions of empowerment (Y) among beef cattle farming groups. To measure the strength and direction of these relationships, the study applied the Spearman's Rank Correlation method. This statistical technique was chosen because the data were collected using a Likert scale, which yields ordinal-level measurements. Additionally, Spearman's test is appropriate for data that may not meet the assumptions of normality, making it ideal for non-parametric conditions often encountered in social research. This method allows for assessing monotonic associations without requiring linear relationships or normally distributed variables, thus providing a reliable basis for evaluating the interaction between social capital and group empowerment.

The correlation analysis using Spearman's Rank test revealed several strong and statistically significant relationships between elements of social capital and dimensions of group empowerment. The strongest correlation was observed between proactive action and access to information ($r = 0.854$, $p <$

0.01), indicating a high level of association between members' initiative-taking and their ability to access relevant information. This was followed by the relationship between trust and accountability, which also showed a very strong correlation ($r = 0.837, p < 0.01$). The element of social norms similarly demonstrated a strong correlation with accountability ($r = 0.775, p < 0.01$). Interestingly, participation in social networks, although it received the lowest average score in previous sections, still exhibited a statistically significant and strong correlation with accountability ($r = 0.751, p < 0.01$).

One notable finding is the relatively low average score of participation in social networks, which contrasts with its strong and statistically significant correlation with accountability ($r = 0.751, p < 0.01$). This suggests that although external engagement among group members is limited, when it does occur, it has a meaningful influence on the group's ability to maintain responsibility and transparency in activities. Such a result indicates a potential leverage point for improving empowerment through targeted network expansion. Overall, the correlation results confirm that each element of social capital plays a relevant role in enhancing different aspects of group empowerment. To illustrate these relationships more clearly, the key correlation values between social capital elements and empowerment dimensions are presented in Table 5.

Table 5. Key Correlations Between Social Capital Elements and Empowerment Dimensions

Social Capital Element	Empowerment Dimension	Correlation Coefficient	Significance
Trust	Accountability	0.837**	0.000
Proactive Action	Access to Information	0.854**	0.000
Social Norms	Accountability	0.775**	0.000
Participation in Social Networks	Accountability	0.751**	0.000
Social Values	Local Organizational Capacity	0.753**	0.000

Note: Correlation is significant at the 0.01 level (2-tailed) Source: Processed primary data, 2024

Qualitative data further supports the statistical findings by illustrating how trust and proactive behaviour manifest in real group experiences. For example, several interviewees described how mutual confidence among members facilitated transparent decision-making and reduced internal conflicts, particularly in the allocation of shared resources. One group leader noted that the ability to access timely information—such as livestock health advice or market prices—often depended on the initiative of certain members who acted as informal information brokers within the group. These qualitative accounts align with the quantitative results, especially the strong correlation between proactive action and access to information ($r = 0.854$). They also reveal that while formal structures are limited, social dynamics

grounded in trust and mutual accountability play a critical role in enhancing the group's operational effectiveness and empowerment.

The data show that several aspects of social capital are closely linked to how empowered the farmer groups feel and act. In particular, group members who take initiative tend to have better access to important information, such as market updates or animal health advice. Similarly, when there is a high level of trust among members, the group is more likely to manage responsibilities transparently and effectively. Even though participation in broader social networks was relatively low, it still showed a meaningful connection to accountability, suggesting that occasional external engagement can still have a positive effect. In short, the stronger the trust, initiative, and shared norms within a group, the more capable and responsible the group tends to be in managing their activities.

Three notable patterns emerge from the correlation analysis. First, trust exhibits the most consistent and strong relationship with empowerment dimensions, particularly with accountability ($r = 0.837$) and local organizational capacity ($r = 0.780$). This indicates that when trust is high among group members, they tend to take greater responsibility and collaborate more effectively in managing group activities. Second, proactive action displays the highest individual correlation with access to information ($r = 0.854$), suggesting that members who are proactive are more likely to seek, access, and distribute valuable information within the group. Third, social values show consistently strong correlations across all empowerment indicators, with coefficients ranging from $r = 0.723$ to 0.763 , implying that shared ethical principles and cultural norms support multiple dimensions of group functioning and empowerment. These findings reflect the essential role of internal social capital components in shaping how effectively farming groups operate and evolve.

These findings underscore the pivotal role of social capital in fostering the empowerment of farmer groups, particularly in traditional rural contexts like North Minahasa. The strong correlations between trust, proactive action, and shared values with key empowerment dimensions suggest that internal social cohesion significantly enhances the group's ability to function transparently, access resources, and organize effectively. This supports existing theoretical frameworks, such as Coleman's (1988) concept of social capital as a facilitator of collective action and Putnam's emphasis on trust and norms in strengthening institutional performance. Moreover, the data add new empirical insight by showing that even elements with relatively low average levels—like participation in social networks—can have a substantial impact on accountability, reinforcing Woolcock's (1998) distinction between bonding and bridging social capital. Overall, these results contribute to a growing body of evidence that empowering rural farming communities is not solely a matter of financial or technical input, but also of cultivating strong, trust-based relationships and collective values within and beyond the group.

Social Capital-Based Policy Model for Beef Cattle Farming Group Development

The development of the social capital-based policy model in this study was grounded in a synthesis of both quantitative and qualitative findings. The model was formulated by identifying the social capital elements that demonstrated the strongest and most consistent correlations with key empowerment dimensions among beef cattle farming groups in North Minahasa Regency. Notably, proactive action showed the highest correlation with access to information ($r = 0.854$), highlighting the critical role of initiative in knowledge acquisition and dissemination. Similarly, trust exhibited a very strong correlation with accountability ($r = 0.837$), indicating its foundational importance in promoting responsible and transparent group governance. These two elements—proactive behaviour and mutual trust—along with social norms (which also correlated strongly with accountability, $r = 0.775$), were selected as core pillars

in the design of the proposed policy model, ensuring that the strategies recommended are evidence-based and rooted in the actual social dynamics of the farming groups.

The proposed policy model consists of three key components designed to strengthen the social foundations of empowerment within beef cattle farming groups: trust-building mechanisms, network enhancement strategies, and norm formalization processes. The first component, trust-building mechanisms, is rooted in the strong correlation between trust and accountability ($r = 0.837$), emphasizing the need for transparent procedures and fair resource distribution to reinforce mutual confidence within groups. The second component, network enhancement strategies, is informed by the finding that participation in social networks, despite its relatively low average score, still maintained a strong correlation with accountability ($r = 0.751$). This suggests that expanding external linkages—through partnerships, knowledge exchange, and multi-stakeholder forums—can significantly enhance group performance. The third component, norm formalization processes, draws on the solid relationship between social norms and accountability ($r = 0.775$), underscoring the importance of establishing clear, participatory rules and expectations to promote consistency, shared responsibility, and effective internal governance.

These three components are summarised in Table 6, which presents a concise overview of the proposed social capital-based policy model. The table outlines each policy component alongside the specific element of social capital it is intended to strengthen, the supporting correlation coefficient derived from the statistical analysis, and the corresponding policy approach recommended. By clearly linking each strategy to empirical findings, the table provides a practical reference for designing interventions that are both contextually grounded and evidence-driven.

Table 6. Components of the Social Capital-Based Policy Model

Policy Component	Related Social Capital Element	Key Correlation with Empowerment	Policy Approach
Trust-Building Mechanisms	Trust	Accountability ($r = 0.837$)	Transparent resource allocation systems
Network Enhancement Strategies	Participation in Social Networks	Accountability ($r = 0.751$)	Multi-stakeholder platforms
Norm Formalization Processes	Social Norms	Accountability ($r = 0.775$)	Participatory norm development

Source: Processed primary data, 2024

The data presented in Table 6 shows that the policy model focuses on three main strategies, each tied to specific strengths found in the farming groups' social capital. First, building trust is seen as essential because groups that trust each other tend to be more accountable. Second, even though many groups have limited connections outside their circle, efforts to strengthen external networks can still greatly improve their ability to share responsibilities and access support. Third, having clear and shared group rules—also known as social norms—helps members work more consistently and responsibly. These three areas form the core of the proposed policy because they are the most strongly linked to helping groups become more empowered and effective.

The description of the model reveals three important patterns that underpin the policy recommendations. First, all three components—trust-building, network enhancement, and norm formalization—are strongly tied to accountability, highlighting its role as a central link between social capital and group empowerment. This implies that any policy seeking to strengthen social capital must also include clear accountability mechanisms to ensure transparency and shared responsibility within groups. Second, the strongest observed correlation in the study, between proactive action and access to information ($r = 0.854$), underscores the need to identify and empower proactive individuals who can drive innovation and act as informal leaders in information-sharing processes. These individuals can serve as leverage points to scale up the impact of social capital. Third, the importance of respecting and reinforcing traditional practices and community-based structures becomes clear, as 68% of farmers believe government support should align with, not override, existing local norms. This suggests that sustainable policies should be designed in harmony with local wisdom, allowing formal interventions to complement—not disrupt—organic community dynamics.

The integration of these three policy components into a single model reflects a deliberate strategy to bridge empirical findings with theoretical insights on social capital and institutional governance. By rooting the trust-building mechanisms in Ostrom's (2009) framework, the model acknowledges that sustainable livestock group management depends not only on material resources but also on social cohesion and reputational trust. Similarly, the inclusion of network enhancement strategies addresses a frequently overlooked dimension of rural development—linking capital, as defined by Woolcock—which allows grassroots groups to access broader institutional frameworks and policy arenas. Without such connections, many community initiatives remain isolated and under-resourced. Lastly, the emphasis on norm formalization resonates with Putnam's view that informal rules, when codified through collective agreement, enhance predictability, reduce misunderstandings, and support long-term cooperation. Together, these components illustrate that social capital is not just a background factor in empowerment—it can be shaped, activated, and institutionalized through well-targeted policy design.

Discussion

The key takeaway from this study is that social capital—especially trust, proactive behavior, and shared norms—plays a foundational role in empowering beef cattle farming groups in North Minahasa Regency. Trust among members significantly enhances accountability, proactive individuals facilitate access to vital information, and strong internal norms ensure group cohesion and consistent governance. While internal bonding capital is robust, the relatively weak external network engagement suggests that bridging capital must be strengthened to unlock broader opportunities. These findings not only reinforce established theories of social capital but also contribute practical, evidence-based insights for designing policies that build on local strengths to promote more sustainable and inclusive rural development.

The strong associations observed in this study can be understood by examining how specific forms of social capital function as enablers of collective behaviour and group efficacy. The high correlation between trust and accountability ($r = 0.837$) reflects the foundational role of interpersonal trust in reducing uncertainty and encouraging cooperative norms, particularly in resource-sharing contexts like communal grazing or breeding arrangements. According to Coleman (1988), such trust acts as an informal enforcement mechanism, making formal contracts or supervision less necessary. In parallel, the strong link between proactive action and access to information ($r = 0.854$) can be attributed to the presence of informal leaders or motivated individuals within farming groups who actively bridge knowledge gaps. As Lin's theory posits, these actors not only access external resources but also help diffuse them internally,

reinforcing empowerment across the group (Lin, 2001). These dynamics are particularly pronounced in semi-formal farmer groups where institutional support is limited, requiring internal social mechanisms to compensate. Thus, the emergence of these patterns is not coincidental, but rather a function of how relational assets are mobilised in real-world farming settings.

The results of this study affirm and expand upon prior findings regarding the role of trust in farmer group dynamics. Studies by Qurniati et al. (2017) and Barraud-Didier et al. (2012) underscore trust as a central pillar of social capital that drives cooperation and accountability within agricultural cooperatives. Our findings support this view, showing a strong correlation between trust and accountability ($r = 0.837$), which indicates that interpersonal confidence among members facilitates transparent and responsible behavior. However, while previous research primarily adopted qualitative or descriptive approaches, our study introduces a quantitative framework that measures the strength of these relationships, offering more precise guidance for policy design.

In addition to trust, our study highlights the role of social norms and proactive behavior—areas less emphasized in earlier literature. Drawing from Cui et al. (2023) and Gross & Vostroknutov (2022), we confirm that internalized norms promote cooperative behavior and consistent group governance, as evidenced by the strong correlation between social norms and accountability ($r = 0.775$). Furthermore, we contribute a novel insight into the importance of proactive action, with the highest correlation observed between proactive members and access to information ($r = 0.854$). This finding enriches Lin's theory of social capital by showing that informal leadership and initiative-taking are powerful enablers of group empowerment, particularly in contexts with limited institutional support.

Most significantly, this research offers a practical contribution through the formulation of a three-component policy model grounded in empirical correlations—trust-building mechanisms, network enhancement, and norm formalization. Unlike previous studies that often stop at identifying challenges, this model responds directly to calls for actionable strategies (Rugema, Sseguya, & Kibwika, 2018; Singh et al., 2023). By integrating statistical evidence with field-based realities, our study provides a context-specific, implementable framework to enhance farmer group performance in North Minahasa and similar rural settings.

This study reveals that social capital, particularly trust, proactive behavior, and internalized norms, is not merely a facilitator of group efficiency but a core mechanism through which empowerment is culturally and institutionally shaped in rural settings. From a social perspective, the findings underscore how trust-based empowerment fosters internal cohesion and mutual accountability, creating a fertile ground for collective action—an insight supported by Bernard et al. (2021) and Qurniati et al. (2017), who showed how interpersonal trust catalyzes cooperation even without formal structures. In North Minahasa, such trust enables decentralized governance in livestock farming, particularly in the absence of strong formal institutions, thus validating the view that relational assets can substitute for institutional infrastructure in promoting rural development.

Historically, the findings reaffirm the role of traditional farming practices as a living heritage that sustains enduring social norms and informal governance structures. As demonstrated by Hua and Brown (2024) and Xu et al. (2018), these practices are not static residues of the past but dynamic frameworks that preserve bonding social capital, ensuring group resilience amid market shifts and institutional voids. In North Minahasa, the continued relevance of inherited norms, such as shared labor rituals or resource-sharing ethics, illustrates how historical continuity sustains cooperative behavior, even under evolving agricultural and economic conditions.

Ideologically, the research challenges top-down development paradigms by presenting a bottom-up empowerment model rooted in local agency and sociocultural dynamics. It affirms insights from Bosworth et al. (2016) and Castro-Arce & Vanclay (2020), emphasizing that rural transformation emerges more sustainably when strategies are embedded in local knowledge systems, rather than imposed by centralized governance. The proposed policy model—involving trust-building, network enhancement, and norm formalization—demonstrates how structural change can emerge from the grassroots, positioning community-driven social capital not just as an outcome, but as an engine of development. This not only enriches current debates in rural sociology and development studies, but also offers actionable pathways toward inclusive, culturally embedded empowerment strategies.

While this study demonstrates the empowering role of internal social capital—particularly trust, shared norms, and proactive behavior—it also reveals several potential dysfunctions. First, the limited presence of external networks, or *bridging capital*, may hinder farmer groups from accessing broader markets, new technologies, and institutional support. As shown by Ploeckl (2023) and Falahat et al. (2020), weak external connectivity can isolate rural communities and delay innovation adoption. Second, overreliance on informal social mechanisms without complementary formal structures can lead to long-term vulnerability, especially during internal conflicts or generational shifts. Research by Chumo et al. (2023) and Mumtaz & Sumarto (2024) underscores that while informal networks can sustain basic cooperation, the absence of formal institutional frameworks can exacerbate inequality and reduce system resilience. Third, strong internal cohesion, although beneficial for unity, may also foster exclusivity and resistance to external actors or new ideas—thus limiting adaptive capacity and inclusive development. These findings highlight that while internal trust and norms are crucial, they must be balanced with strategies to build external linkages and institutional integration to avoid long-term structural dysfunctions in community empowerment.

To address the strengths and dysfunctions revealed in this study, three integrated policy actions are essential. First, structured platforms for external collaboration—such as cooperative networks, multi-stakeholder forums, or regional farmer exchanges—should be developed to strengthen bridging social capital and improve access to markets, technologies, and institutional support, responding to challenges highlighted by Ploeckl (2023) and Falahat et al. (2020). Second, formal institutional mechanisms must be embedded to complement informal social structures; this includes deploying agricultural extension agents who can translate traditional practices into formal governance models, ensuring resilience during internal conflicts or generational change as emphasized by Chumo et al. (2023). Third, group capacity must be enhanced through inclusive leadership training, participatory governance, and innovation literacy to avoid exclusivity and resistance to change, while fostering adaptability and inclusion, particularly for youth and women, as underscored by Mumtaz and Sumarto (2024). Together, these actions offer a comprehensive framework for transforming trust-based empowerment into a sustainable, adaptive, and inclusive rural development strategy.

CONCLUSION

This study concludes that social capital—particularly trust, proactive behavior, and shared social norms—plays a foundational role in empowering beef cattle farming groups in North Minahasa Regency. These elements significantly contribute to group accountability, access to information, and overall cohesion, forming a solid social infrastructure that enables sustainable livestock development. The strong correlations identified—such as between trust and accountability ($r = 0.837$), proactive action and access to information ($r = 0.854$), and social norms and accountability ($r = 0.775$)—highlight the operational

importance of these social dimensions in traditional farming systems. The findings also affirm the value of indigenous knowledge systems and community-based practices that continue to shape group cooperation and resilience in livestock farming.

Scientifically, this research contributes to the literature by contextualizing social capital theory within traditional beef cattle farming practices, a domain that has been underrepresented in previous studies. Unlike earlier research that treats social capital or livestock development in isolation, this study integrates the two and proposes an evidence-based policy model tailored to local socio-cultural dynamics. The novel contribution lies in the empirical demonstration of how specific dimensions of social capital interact with empowerment indicators, providing practical insights for agricultural policy design and rural development strategies, particularly in developing regions where formal institutional support is limited.

However, the study is not without limitations. The sample size was relatively small (30 respondents), which may limit generalizability across all beef cattle farmers in the region. The research employed a cross-sectional design, which captures only a snapshot of social capital dynamics without accounting for temporal variations. Moreover, reliance on self-reported data through Likert-scale questionnaires may have introduced response bias or oversimplified complex social relationships. Future research should consider longitudinal and comparative studies across regions, the inclusion of more diverse stakeholders, and the use of mixed methods to enrich the understanding of social capital's role in agricultural empowerment. Additionally, exploring how digital tools might enhance traditional social capital mechanisms presents an emerging area for further study.

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