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Measuring Group Dynamics Index (GDI) of Beef Cattle Farmers in West Lombok Regency, West Nusa Tenggara

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ABSTRACT

This study examines the social dynamics of cattle farmer groups as a strategic approach to supporting the sustainability of cattle farming in rural areas. There is evidence to suggest that social dynamics play an important role in livestock farming, impacting productivity, efficiency and sustainability. The main objective of this study was to develop a Group Dynamics Index (GDI) with a specific focus on evaluating eight key elements of group dynamics: purpose, structure, task function, coaching, cohesiveness, atmosphere, pressure, and group effectiveness. The study employed a quantitative descriptive survey methodology, involving 150 respondents drawn from three sub-districts in West Lombok Regency. Data collection was conducted using a structured Likert scale-based questionnaire, which facilitated the measurement of respondent's perceptions and attitudes. A weighted analysis approach was applied to the gathered data to generate a cumulative index. The findings indicate that structural factors, such as decision-making and task division, and non-structural elements, including interpersonal relationships and social support, significantly influence group dynamics. It was observed that farmer groups in the Lembar sub-district demonstrated the highest cumulative index (0.68), exhibiting excellence in aspects such as group structure and task function. Farmer groups in the Narmada sub-district exhibited a cumulative index of 0.65, distinguishing themselves through their notable group cohesiveness and atmosphere. Conversely, the farmer group in Gunung Sari demonstrated strong member loyalty (0.60) yet exhibited a need for substantial enhancement in internal management, particularly concerning task function and group pressure. The study concludes that the sustainability and effectiveness of group dynamics are contingent on the balanced integration of structural and non-structural elements. A comprehensive, holistic approach that harmonizes internal management and social relations is essential to support overall group performance. The GDI proved to be a relevant and applicable tool for comprehensively evaluating group dynamics.

Keywords: Group dynamics, Farmer empowerment, Beef cattle, Social aspects, Group dynamics index

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Introduction

The livestock industry constitutes a fundamental component of the West Nusa Tenggara (WNT) developmental landscape, particularly regarding its impact on the regional economic structure (Taqiuddin *et al.*, 2023). This province is a major center of the national beef cattle population. Cattle farming is significant for food provision and income generation for rural communities, particularly in West Lombok. Many households in this region raise cattle for personal consumption and market sale (Media *et al.*, 2023).

The 2023 Agricultural Census found about 39,971 livestock farmers in West Lombok, making up 30.8% of the region's total agricultural-related jobs (BPS, 2023).

Rural cattle farming faces challenges, including efficiency, resource access, and climate change. Empowering farmer groups is a promising strategy to address these challenges. These groups share information, resources, and technological innovations to improve livestock productivity (Gandasari *et al.*, 2021; Suherman *et al.*, 2023). However, farmer groups often face challenges in cooperation due to differences in

social, economic, and cultural backgrounds among members (Hasanah *et al.*, 2024). Variations in views and tensions between group members can be attributed to factors such as education level, economic status, and cultural norms (Anwar *et al.*, 2023).

A substantial body of research has demonstrated that the efficacy of farmer groups is contingent upon the extent of trust, communication, and participation among members in decision-making processes (Musabbikhin *et al.*, 2020; Annafi *et al.*, 2023). Consequently, groups that effectively cultivate trust and facilitate effective communication tend to demonstrate enhanced efficacy in managing shared resources and navigating collective challenges, such as market access and feed procurement (Suripto *et al.*, 2023; Bete *et al.*, 2024; Simamora *et al.*, 2024). Conversely, the absence of trust among group members can significantly impede the realization of collective objectives (Fadliadi *et al.*, 2023).

Research on cattle farming in WNT has historically centered on technical domains, including production efficiency (Mastur *et al.*, 2022), reproduction (Ashari *et al.*, 2022), feed (Dilaga *et al.*, 2022; Muktasam *et al.*, 2022; Amin *et al.*, 2023; Putra *et al.*, 2025), and business analysis (Hermansyah *et al.*, 2023). However, studies examining the role of social factors in the institutional success of farmers remain scarce. Social dynamics, such as cooperation, communication, and participation, have been identified as crucial factors in enhancing group effectiveness (Muning *et al.*, 2024; Simamora *et al.*, 2024). For instance, Damanik, (2015) found that group functions and cohesiveness significantly influence dynamics, while Siburian *et al.* (2023) highlighted the importance of social norms in cooperative environments. Other studies on groups like farmer groups in Gorontalo and Timor Tengah Utara have also shown that social capital, including trust and networks, plays a vital role in improving dynamics and effectiveness (Wulanjari and Setiani, 2019; Bete *et al.*, 2024). The findings highlight the importance of developing and implementing measurement tools to understand social dynamics in farmer groups. These tools would allow for a targeted approach to managing and enhancing group cohesion, functionality, and effectiveness. This would ensure data-driven interventions are tailored to specific group needs (Seran *et al.*, 2024; Sugiarto and Cahyo, 2025).

This research aims to develop the Group Dynamics Index (GDI) as a tool to measure various social aspects of cattle farmer groups objectively and systematically. The GDI encompasses eight components of group dynamics, including: (1) group objectives as goals pursued collectively by a group of individuals with a shared purpose; (2) structure as the organizational framework that governs interactions within a group, with the overarching objective being the achievement of predefined goals; (3) The task function refers to the collection of responsibilities that each group

member must fulfill, based on their designated role within the group structure; (4) Group coaching and maintenance involve efforts aimed at sustaining the group's continuity and well-being; (5) Group unity or cohesiveness signifies the collective commitment of all members to foster strength and solidarity within the group; (6) The group atmosphere encompasses the shared emotional climate, attitudes, and general mood within the group, ranging from joy and enthusiasm to moods of uncertainty or elation; (7) Group pressure refers to any factors that may induce stress or tension within the group, whether originating from internal dynamics or external influences; and (8) The effectiveness of the group in achieving its objectives can be measured by assessing the group's productivity, the morale of its members, and their overall satisfaction with the group experience (Damanik, 2015; Simamora *et al.*, 2024). The utilization of GDI in measuring group dynamics facilitates a more precise identification of the challenges faced by farmer groups. This approach enables a more targeted empowerment strategy, aligning with each group's needs and characteristics.

Additionally, implementing GDI measurement was anticipated to facilitate identifying critical domains within the farmer group's institutional framework, thereby enhancing the effectiveness of cooperation, competitiveness, and productivity. In the context of West Lombok District, implementing GDI can facilitate the design of empowerment strategies more aligned with the needs and characteristics of the respective groups. Moreover, the GDI model's adaptability renders it a potentially viable solution for implementation in analogous regions, thereby ensuring broader benefits for farmer empowerment in Indonesia. This research endeavour aims to contribute substantially to formulating a more effective, sustainable, and contextualized cattle farmer empowerment strategy following local conditions in West Lombok District.

Materials and Methods

Research location

The research was conducted in three sub-districts that represent areas with different characteristics in the District of West Lombok: (1) The sub-district of the Lembar sub-district (Southern region), located on the southwest coast of Lombok, with the characteristics of the area is lowland to hilly and a relatively dry climate. Cattle farmers often rely on additional feed or buy forages from outside in the dry season due to the limited availability of forage for animal feed; (2) The sub-district of Narmada (central region) is a hilly and highland area with more fertile soil, high rainfall, and many spring water sources. The forage availability is abundant throughout the year, supporting the intensive fattening and breeding system; and (3) The sub-district of Gunung Sari (Northern region), characterized by high rainfall,

resulting in hilly and mountainous areas. The high precipitation levels enhance the availability of forage feed. However, accessibility to several hilly regions challenges feed distribution and cattle marketing. The selection of West Lombok District

as the research location was based on its status as one of the group-based cattle business development areas in WNT. As illustrated in Figure 1, the coordinate map of each sampling location is presented for this study.

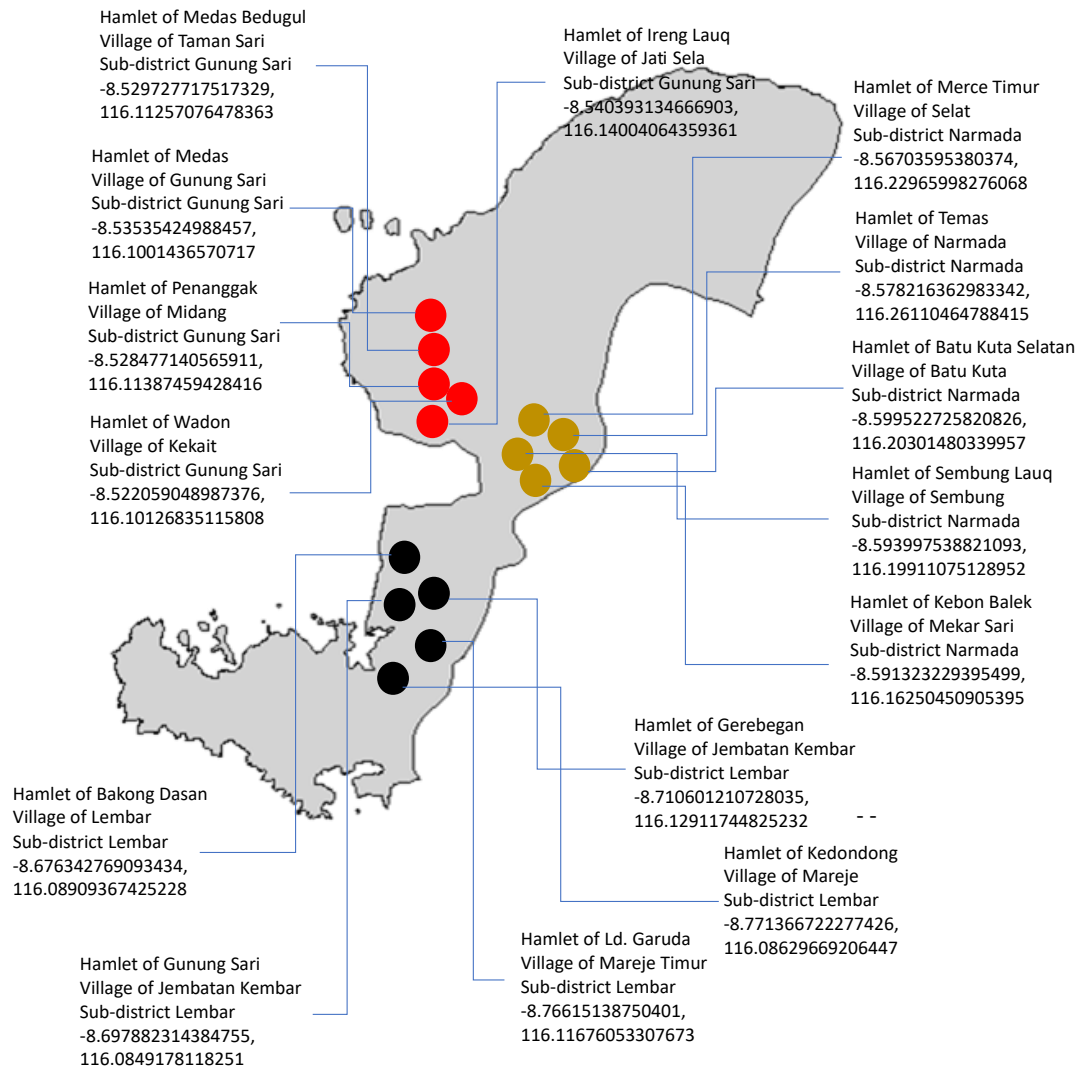


Figure 1. Coordinate map of each sampling location

Sample and respondent

In this study, 150 respondents were selected, with 50 respondents per sub-district, using a simple random sampling technique. We did not use specific sample calculation formulas such as Slovin, G*Power, or Lemeshow to determine the sample size. Instead, we followed the general guideline provided by Sekaran and Bougie (2013), which recommends a minimum sample size of 30-50 respondents per subgroup in social research. By allocating 50 respondents per sub-district, we ensured a balanced and unbiased distribution of the samples, which was deemed sufficient to accurately capture the dynamics of cattle farmer groups in West Lombok District. This sample size is considered adequate to provide valid and relevant results within the context of this research.

Observation, instruments, and data collections

The present study employed a descriptive quantitative approach through a survey method to systematically describe and analyse social phenomena in beef cattle farmer groups in West Lombok Regency. The survey method was selected because it facilitates the data collection from a substantial number of respondents in a relatively brief and efficient timeframe, thereby providing an overview of the characteristics and dynamics of a representative group of farmers (Sugiyono, 2013). The quantitative descriptive approach emphasizes data collection and analysis in numbers or quantities, eschewing further analysis of causal relationships (Creswell, 2018). This approach aligns with the research objective of describing the dynamics of breeder groups by

measuring the group dynamics index based on data from respondents' answers to questions in the questionnaire. The selection of West Lombok District as the research location was based on its status as one of the group-based cattle business development areas in WNT.

This research also applied several data and information collection strategies to strengthen the survey findings, namely observation, interviews, and documentation. Observation through direct observation of group activities in conjunction with interview activities explored more in-depth information about the group profile. Documentation was used to support data validity by taking pictures or records of events relevant to aspects of group dynamics.

The primary instrument employed in the study was a structured questionnaire designed to assess respondents' attitudes on a Likert scale with five alternative responses. Strongly Agree (SA) = 4, Agree (A) = 3, Moderately Agree (MA) = 2, Moderately Disagree (MD) = 1, and Disagree (D) = 0. This scale allows for a more objective measurement of the respondent's attitude or opinion and provides a clearer picture of the eight elements of group dynamics, namely: group goals; group structure, functions, and tasks; coaching and development; group cohesiveness; group atmosphere; group pressure; and group effectiveness.

Data analysis

The data obtained from the administering questionnaires was collated and processed with Microsoft Excel and then subjected to a descriptive analysis. To calculate the GDI, it is first necessary to calculate the index of each element of group dynamics obtained from the average index per question item. The index of each question item on each element of group dynamics uses the following formula:

$$\text{Indeks} = \frac{\sum \text{component scores}}{\text{maximum scores}}$$

This methodology follows a composite index approach, similar to the Livelihood Vulnerability Index (LVI) developed by Hahn *et al.* (2009), aggregating multiple indicators into a composite index to assess community vulnerability factors. While the current study adapts this general approach for calculating the group dynamics index (GDI), the index calculation methodology is largely inspired by prior research, particularly in livelihood assessments.

The subsequent stage involves the allocation of weights to each component of group dynamics, thereby assigning greater importance to aspects/elements deemed more influential on group dynamics. To calculate the cumulative group dynamics index (GDI), we first measure the score for each component based on the responses from the questionnaire. Each question in the survey corresponds to specific group dynamics, such as purpose, structure, task function, coaching,

cohesiveness, atmosphere, pressure, and group effectiveness. The scores reflect the degree of effectiveness observed in each element. The weighting for each element is determined based on its perceived importance in influencing the overall group dynamics. This process is akin to the methodology used in Hahn *et al.* (2009), where multiple indicators are combined into a composite index using a weighted average approach. The final GDI is categorized into five levels based on the cumulative scores, and these are interpreted as follows:

1. Not dynamic (0.00-0.19): The group is stagnant, with minimal communication and collaboration. Decisions are made in isolation, and there is no significant progress in the group's relationships.
2. Less dynamic (0.20-0.39): The group shows some emerging dynamics, but challenges persist. Communication is limited to a few members, and decision-making remains concentrated.
3. Moderately dynamic (0.40-0.59): The group begins to function more efficiently, with better communication and increasing collaboration. Engagement is higher, but full efficacy has not been achieved.
4. Dynamic (0.60-0.79): The group is highly functional, with open and transparent communication. Most members actively participate in discussions, and decision-making is collective.
5. Very dynamic (0.80-1.00): The group is fully cohesive, with strong cooperation, open communication, and decisions made through consensus. The dynamics are positive and productive.

This weighting and scoring method helps to quantify the group's overall dynamics, making it possible to identify areas of improvement for interventions aimed at enhancing group cohesion and functionality.

Results and Discussion

Existing Conditions of Cattle Farming in West Lombok

Cattle farming in West Lombok has an important role in the regional economy, both for providing of food and as a source of income for rural communities. The geographical advantages of West Lombok, with fertile soil and sufficient water availability, support the cattle farming business. This is seen in areas with high rainfall and fertile soils, which allow for the availability of animal feed throughout the year, supporting cattle fattening and breeding activities (Jalal *et al.*, 2023; Media *et al.*, 2023). Nevertheless, despite favorable natural conditions, the livestock sector faces several challenges. One of the main problems is limited access to feed, especially in the dry season, when natural feed is difficult to find and farmers are forced to buy additional feed from outside the region (Jalal *et al.*, 2023). Most farmers

in West Lombok manage small-scale cattle farming, on average only raising 1-3 heads, which makes cattle farming more of a secondary source of income than a main livelihood (Karyadi *et al.*, 2021).

In addition, farmers in West Lombok often experience difficulties in accessing modern technology and efficient management practices. Capital constraints are also a major obstacle, making it difficult for farmers to invest in livestock improvements, infrastructure, and production processes (Karyadi *et al.*, 2021; Jalal *et al.*, 2023). Social and economic factors also affect the dynamics of farmer groups, where communication, cooperation, and participation in decision-making greatly influence the results achieved. Group dynamics have been shown to play a major role in the effectiveness and sustainability of livestock activities, with variations in cohesion, trust, and management affecting the success rate of farmer groups. This condition shows the importance of understanding the structural and social aspects of cattle farming in West Lombok. The development of cooperative structures between farmers can provide the necessary support to overcome challenges related to capital and resources, thereby improving productivity and overall economic performance.

Respondent profiles

Understanding the respondent profile is a decisive first step in analyzing the dynamics of cattle breeder groups. This study involved five (5) groups of cattle farmers in three sub-districts. In Gunung Sari District, five groups of farmers are involved: Ingin Maju (Gunung Sari Village), Pade Selamet (Midang Village), Kebon Odek (Jati Sela Village), Ternak Wadon (Kekait Village), and Beriuk Bias (Taman Sari Village). The number of members ranges from 11 to 57 cattle-farmers per group. Narmada district includes groups of cattle

farmers: Mulia (Selat Village), Pade Girang (Mekar Sari Village), Karya Bakti (Narmada Village), Pade Mare (Batu Kute Village), and Patuh Angen (Sembung Village). The range of members is between 24-68 cattle-farmers per group. Meanwhile, in Lembar District, the farmer groups include: Maju Jaya (Jembatan Kembar Village), Silak Mampir (Mareje Village), Patuh Angen (East Mareje), Bakong Kapitan (Lembar Village), and Embun Pupuh (Jembatan Kembar Village). The number of members ranges from 14-23 cattle-farmers per group.

The profiles of these groups are important for understanding the internal dynamics and capacity of the group. In addition, socio-economic characteristics also need to be analyzed as they affect the group members' behaviour patterns, interactions, and participation rates (Simamora *et al.*, 2024), which in turn affects the Group Dynamics Index (GDI). This information is also relevant to identify potential challenges that can affect the effectiveness of group management and the sustainability of cattle farming businesses.

Respondent age. The age-related characteristics of the respondents played a vital role in the dynamics of the cattle breeder group. Most of the farmers are in the productive age of 41-50 years, which indicates a high level of involvement in the group. In Gunung Sari, 42% of respondents were aged in this range, Narmada was 40%, and Lembar was recorded at 44% (Table 1). This age group generally has considerable experience in livestock farming, which affects stability and active participation in livestock business management (Haryadi *et al.*, 2019; Rohaeni *et al.*, 2024). However, the participation of young farmers (in the age range of 20-30 years) is still relatively low, at around 6-8% in each sub-district.

Table 1. Age of respondents' cattle farmers

Age (year)	Gunung Sari		Narmada		Lembar		Total	
	Number	%	Number	%	Number	%	Number	%
20-30	3	6.0	4	8.0	3	6.0	10	6.7
31-40	9	18.0	12	24.0	13	26.0	34	22.7
41-50	21	42.0	20	40.0	22	44.0	63	42.0
51-60	12	24.0	13	26.0	10	20.0	35	23.3
61-70	5	10.0	1	2.0	2	4.0	8	5.3
Total	50		50		50		150	100

The involvement of young farmers is important for the regeneration and survival of the group, as they are more open to innovation and the application of new technologies that can increase the productivity of cattle farming. Consequently, the limited involvement of young farmers presents a significant challenge to the sustainability of the farming group. This trend underscores the need for strategies to foster a more inclusive and supportive environment, which would encourage greater participation from this younger demographic. This aligns with previous studies indicating that young farmers are more adaptable to changes and technological advancements that can improve the

livestock business (Gandasari *et al.*, 2021; Baharuddin *et al.*, 2024).

Education level. The educational background of the respondents significantly affects their involvement in cattle management and the dynamics of farmer groups. Most respondents have only an elementary education, with 52% in Gunung Sari, 56% in Narmada, and 56% in Lembar (Table 2), which limits their ability to access new technologies and information critical for improving farming practices. This low educational level impacts communication, decision-making, and the capacity to utilize complex information, thereby hindering effective group functioning (Marselina *et*

al., 2024). While a smaller proportion has higher education, those with junior or senior high school diplomas are more open to adopting innovations that support livestock business sustainability (Gandasari *et al.*, 2021; Baharuddin *et al.*, 2024). Fahmi and Gustiani (2022) highlight the importance of tailoring interventions to farmers' educational levels to enhance group dynamics and

participation. Additionally, hands-on training has been shown to increase confidence in adopting new technologies, improving group effectiveness (Febrianto *et al.*, 2024). Therefore, understanding the educational profile of farmers is crucial for designing effective programs that foster group sustainability and adaptability.

Table 2. Education level of respondents' cattle farmers

Level of education	Gunung Sari		Narmada		Lembar		Total	
	Number	%	Number	%	Number	%	Number	%
Not School	9	18.0	0	0.0	4	8.0	13	8.7
Elementary School	26	52.0	28	28.0	30	69.0	84	56.0
Junior High School	6	12.0	11	22.0	9	18.0	26	17.3
Senior High School	9	18.0	9	18.0	5	10.0	23	15.3
Bachelor	0	0.0	2	4.0	2	4.0	4	2.7
Total	50		50		50		150	100

Farmer experiences. The respondents' cattle-farming experience exhibited significant variation across the sub-districts. In Gunung Sari District, half of the farmers (50%) possess 9-16 years of cattle farming experience, indicating a relatively high level of expertise in cattle management. In contrast, only 20% of farmers in Narmada and 34% in Lembar have similar experience in cattle farming (Table 3). Farmers with less experience may still be in the learning phase and require additional support in terms of training and access to the latest livestock management techniques (Gandasari *et al.*, 2021; Baharuddin *et al.*, 2024). Longer cattle farming experience is strongly associated with a deeper understanding of

cattle-farmers group dynamics, making experienced farmers crucial for improving group effectiveness, addressing challenges, and adopting new technologies. These farmers often mentor less experienced members, guiding cattle management and fostering solidarity within the group (Amam *et al.*, 2021; Bete *et al.*, 2024; Hasanah *et al.*, 2024). The presence of such experienced farmers enhances the group's ability to overcome challenges and improve the productivity of their cattle farming. Ultimately, cattle farming experience plays a key role in determining farmers' group capacity and effectiveness in sustainably managing cattle.

Table 3. Cattle-farming experience of respondents' cattle farmers

Experience (year)	Gunung Sari		Narmada		Lembar		Total	
	Number	%	Number	%	Number	%	Number	%
1 – 8	10	20.0	10	20.0	5	10.0	25	16.7
9 – 16	25	50.0	10	20.0	16	32.0	51	34.0
17 – 24	6	12.0	7	14.0	9	18.0	22	14.7
25 – 32	5	10.0	10	38.0	15	30.0	39	26.0
>33	4	8.0	4	8.0	5	10.0	13	8.7
Total	50		50		50		150	100

Cattle ownership. The results of our study indicate that approximately 74.7% of farmers engage in small-scale livestock farming, owning between 1-3 cattle (Table 4). This pattern reflects the prevalence of small-scale livestock farming in West Lombok, where cattle farming often serves as a supplementary business or supports the family economy (Yulianti *et al.*, 2021). Specifically, 78% of respondents in Gunung Sari own 1-3 cattle, 76% in Narmada, and 74.67% in Lembar. While this small-scale livestock ownership can enhance solidarity among group members due to shared experiences and challenges, it also presents potential difficulties

in group dynamics. Differences in the scale of livestock ownership often translate into varying needs and goals. Kartadjumena *et al.* (2022) found that farmers with larger livestock herds tend to focus on business expansion, whereas Nurdiansah *et al.* (2020) observed that those with smaller cattle-farmer prioritize sustainability and immediate needs. These contrasting priorities can lead to conflicts in shared decision-making processes. Additionally, small-scale cattle ownership may exert pressure within the group, potentially undermining group cohesion, cooperation, and overall productivity.

Table 4. Cattle ownership of respondents' cattle farmers

Cattle Ownership (heads)	Gunung Sari		Narmada		Lembar		Total	
	Number	%	Number	%	Number	%	Number	%
1 – 3	39	78.0	38	76.0	35	70.0	112	74.7
4 – 6	10	20.0	11	22.0	14	28.0	35	23.3
>6	1	2.0	1	2.0	1	2.0	3	2.0
Total	50		50		50		150	100

Profiles of cattle farmer group

Response to local issues as basis for group formation. Cattle farmer groups in West Lombok Regency were established to address specific community needs, particularly environmental concerns. For instance, the Ingin Maju-Gunung Sari Farmer Group was formed in 1997 in response to widespread complaints about the adverse environmental impact of unmanaged cow dung waste. Similarly, the Pade Girang in Narmada and the Wadon in Gunung Sari Farmers Group have demonstrated significant progress in tackling these issues.

The formation of these groups was primarily driven by farmers' growing awareness of the environmental challenges associated with cow dung management. Over time, these groups have adopted a more systematic approach to cattle management by implementing a collective, cage-based system (Mashur *et al.*, 2021). This transition reflects a broader understanding of shared goals, which are a crucial element in fostering social cohesion. The collective orientation of these groups motivates members to join and actively participate in achieving mutual objectives.

The formation of cattle farmer groups is often driven by the need for security against livestock theft, as exemplified by the Patuh Angen-Lembar Group, the Beriuk Bias-Gunung Sari Group, and the Silak Mampir-Narmada Group. These groups emerged in response to the high incidence of livestock theft, which had caused significant financial losses for farmers. The need to ensure livestock security prompted these groups to foster social solidarity among their members. According to Hadinata *et al.* (2020), this solidarity serves as a form of social capital that strengthens group cohesion, particularly when members face shared challenges. The formation of cattle farmer groups in West Lombok reflects the interplay between socioeconomic and environmental factors within local social dynamics. Consequently, each group possesses unique characteristics that influence how members interact and collaborate.

Age of the group: stability, sustainability, and regeneration. The cattle farmer groups in West Lombok Regency exhibit age variation reflecting differences in institutional stability and dynamics. For example, the Kebon Odek-Gunung Sari Group, with a history of eight years, is in the early stages of strengthening its organizational structure and fostering a collective spirit among its members. By contrast, the Pade Selamat-Gunung Sari Group, with a history spanning over four decades, evinces a high level of organizational stability, indicative of its organizational resilience. A study by Amam *et al.* (2019) underscores that group stability manifests in managing internal conflicts, responding to evolving market conditions, and fostering robust relationships among members. The sustained membership structure of the Pade Selamat Group over 40 years proves its capacity to navigate challenges and adapt to evolving circumstances.

However, the maturity of a group's age does not guarantee its sustainability. For instance, the Mulia-Narmada Livestock Group has experienced stagnation in membership, with numbers remaining constant since its establishment, indicating challenges in member regeneration, particularly in attracting the involvement of younger generations. As the majority of group members fall within the productive adult age range (41–50 years), the groups' regeneration becomes increasingly complex, creating a risk of insufficient younger labor to take on strategic roles within the group. The low involvement of younger members is evident from the respondent profile data, which shows that only 6.66% of group members belong to the younger generation. This situation gives rise to a number of concerns, including the potential for reduced long-term innovation and adaptability within the group. It is, therefore, essential to implement strategies that can encourage greater youth participation, thus ensuring the group's ongoing sustainability.

Assessing group sustainability requires applying sustainability indicators encompassing social, economic, and environmental dimensions. For instance, comprehensive sustainability indicators integrating these three dimensions are essential for measuring a group's sustainability, particularly in family farming (Wohlenberg *et al.*, 2022). These indicators evaluate a group's capacity to balance productivity, environmental sustainability, and social well-being. Additionally, indicators considering sustainability across various dimensions are crucial for ensuring the long-term viability of businesses (Sulaksono *et al.*, 2003). Implementing these indicators identifies areas requiring improvement and safeguards a group's future continuity and competitiveness (Sulaksono *et al.*, 2003; Simamora, 2020; Wohlenberg *et al.*, 2022).

The phenomenon of weak regeneration has been demonstrated to exert a detrimental influence on the social dynamics and the efficacy of cattle farmer group development (Risjana *et al.*, 2020; Perdana and Widodo, 2022). The inability of groups to attract new members weakens social sustainability, as evidenced by the Wadon Livestock Farmer Group, which has experienced a decline in membership due to many farmers shifting to other professions. This phenomenon underscores the notion that group sustainability is influenced not only by its age but also by its adaptability to social and economic changes. Groups that fail to adapt to such changes are likely to experience a decline in social cohesion, which in turn has a detrimental effect on key elements of group dynamics, such as organizational development and collective interactions among members. This underscores the importance of fostering adaptability and resilience in farmer groups to ensure their continuity and effectiveness.

Scale of ownership: equity and complexity dynamics. Most cattle farmers in West Lombok have small herds of 1–3 head of cattle. This is

typical of smallholder livestock farming in rural areas of Lombok Island. This pattern fosters social homogeneity, as seen in the Wadon and Beriuk Bias Farmer Groups in Gunung Sari, where most members operate at similar scales of livestock production. Group homogeneity has a positive impact on group cohesion. Members have similar needs and goals, such as increasing household income or maintaining environmental cleanliness. The uniformity in scale that results also facilitates group management. This is because members have comparable expectations and requirements, making coordinating activities and implementing objectives easier.

In contrast, livestock farmer groups with more heterogeneous scales of livestock ownership face more complex dynamics, as evidenced by the Patuh Angen-Lembar Group. This group's variation in business scales creates differing orientations among members, as highlighted in previous studies (Nurdiyansah *et al.*, 2020; Kartadjumena *et al.*, 2022). Members with more significant livestock holdings prioritize business expansion and long-term profits, while those with smaller-scale operations focus on day-to-day needs. These differences in orientation impact collective decision-making processes, particularly concerning resource allocation and group strategies. The imbalance in these priorities challenges the cohesion of the group, as it can lead to conflicting interests and hinder effective collaboration.

Social pressure constitutes a pivotal component within the GDI, its manifestation being influenced by disparities in business scale across group members. When group decisions favor members with more extensive operations, those with smaller holdings may experience a sense of neglect, thus engendering a state of dissatisfaction that weakens group cohesion and impedes active participation in collective activities. Such conditions are particularly evident in groups exhibiting highly diverse membership in terms of business scale, a state of affairs that has the potential to engender imbalances in decision-making processes. This pressure underscores the importance of inclusive group management to maintain harmony among members, particularly in groups with varying socioeconomic structures.

Cattle farming orientation as a variety of farmer adaptation. The cattle farmers in the study area adopt divergent management strategies, reflecting their varied approaches to adapting to local potential and market demands according to Williams *et al.* (2022). The Ingin Maju-Gunung Sari Livestock Farmer Group, for instance, prioritizes breeding, necessitating intensive technical expertise in domains such as reproductive management and animal health to produce high-quality breeding stock. Conversely, the Pade Mare-Narmada Livestock Farmer Group prioritizes fattening, seeking to achieve rapid returns with a less complex management cycle that aligns with short-term market demands. This

diversity in focus underscores the strategic responses of the groups to market opportunities and the availability of local resources, thereby demonstrating how each group tailors its activities to its specific circumstances (Valerio *et al.*, 2024).

The focus of livestock management directly influences the execution of functions and tasks within the GDI, as divergent management orientations necessitate distinct approaches and coordination among members. Breeding groups frequently encounter challenges in uniting members with disparate levels of technical expertise. For instance, members with limited knowledge may require training or guidance to meet the technical standards needed for breeding, as Ssekibaala *et al.* (2024) found in the case of the community-based bull breeding programme in Uganda. Conversely, fattening groups still require effective collective management, particularly in feed management, even though their technical dynamics are less complex than breeding.

The diversity of focus inherent in such groups gives rise to unique social dynamics, which in turn reflect the characteristics of the members (Rustinsyah, 2019). To illustrate this point, consider the Kebon Odek-Gunung Sari Group, which combines breeding and fattening. This group consists of members with varying skill sets, and precisely this diversity necessitates a clear division of tasks to ensure the operational success of the group. Furthermore, establishing an effective work system is key to maintaining harmony among members with different levels of expertise. The success of the group is contingent on the alignment of livestock management focus with the individual capacities of its members, ensuring synergy between collective goals and the technical abilities of each member. This demonstrates that the choice of livestock management strategy is not only a technical matter but also influences the social relationships within the group.

Dynamics of members and cattle as sustainability indicators. Since their establishment, most livestock farmer groups in West Lombok have demonstrated membership and livestock population development. For instance, the Ingin Maju-Gunung Sari Group has experienced an increase from 40 members with 90 cattle to 57 members with 180 cattle. This growth indicates the group's appeal in meeting the needs of farmers, both economically and socially (Sugiarto *et al.*, 2024). The driving factors behind this growth are the collective benefits that members derive from participating in the group, including shared access to resources, protection of livestock, and enhanced productivity (Asai *et al.*, 2018; Rustinsyah, 2019).

The data presented here underscores the group's success in functioning as a socioeconomic entity that effectively caters to the needs of its members. However, it should be noted that not all groups exhibit a similar trend. The Wadon-Gunung Sari Group, for instance, experienced a decline in membership from 20 to 11 due to members shifting

professions, including working abroad. This decrease highlights significant challenges in retaining members, mainly when the group is unable to offer competitive incentives or benefits compared to opportunities in other sectors.

The reduction in active members disrupts the balance of social dynamics within the group. This has a consequential impact on the distribution of tasks within the group, which becomes more onerous for the remaining members. The aforementioned situation has repercussions for the group's development within the GDI, particularly concerning maintaining social cohesion and member engagement. The dynamics of membership and livestock population development serve to reflect the success of the group in question whilst simultaneously highlighting the intricacies of the social situation that exerts its influence upon it (Hilmiati *et al.*, 2024). The relationship between the group's founding background, age, scale of livestock ownership, and management focus reveals how these factors are interconnected in shaping the sustainability pattern of the group. Groups with consistent membership growth are better able to maintain social stability and collective function compared to those experiencing a decline in membership (Haryadi *et al.*, 2019).

The importance of group dynamics as an indicator of sustainability has been widely discussed in the literature. According to (Wohlenberg *et al.*, 2022), sustainability is often measured through indicators that reflect not only economic factors but also social and environmental dimensions, and these indicators can help track how well a group can sustain itself over time. In the context of livestock farming groups, the group's sustainability is closely tied to its ability to manage both human resources (members) and physical resources (livestock). When membership is stable or growing, it often indicates effective social cohesion and a high level of engagement, which are critical components of long-term sustainability. Conversely, a decline in membership can destabilize group dynamics and hinder sustainability efforts, as it often leads to decreased labor force availability and shifts in social roles and responsibilities.

Sulaksono *et al.* (2003) further highlight that sustainable livestock farming requires attention to social and economic dimensions, where social dynamics, such as the relationships between group members and their shared responsibilities, are just as important as economic incentives. A group's ability to maintain or grow its membership can reflect its overall success in

balancing these factors. Groups with a more engaged and stable membership are better positioned to invest in sustainable practices, such as improving livestock care and adopting new technologies, further supporting their long-term viability. In contrast, groups that face challenges in member retention may struggle to maintain the momentum necessary for continued growth and innovation.

This analysis underscores the importance of the GDI as a tool for understanding how socioeconomic factors contribute to the success or challenges faced by livestock farmer groups in West Lombok Regency. It highlights the intricate relationship between membership dynamics, resource management, and the overall sustainability of the group, which is a reflection of the group's capacity to adapt to changing conditions while maintaining a strong internal structure and cohesive member involvement.

Analysis of the elements of group dynamics

Group Objectives. The Cattle Farmers Group in Lembar District demonstrated the highest clarity regarding its founding purpose, with an index score of 0.78. This finding suggests that the group members possess a robust understanding of their collective vision, facilitated by regular interaction and communication. The clarity of purpose in the rural farmer groups fosters enhanced coordination, ensuring members are aligned with the group's objectives (Liu *et al.*, 2024). A comparable outcome was observed in the Cattle Farmers Group in Gunung Sari, which exhibited nearly identical results (0.76). By contrast, the Narmada region exhibited a lower index (0.65), indicating that the communication efforts concerning the group's objectives to its members were less efficacious than in the other two regions. For the congruence between the group's goals and the motivations of its members, Gunung Sari demonstrated exceptional performance, achieving an index of 0.81, indicating a high degree of alignment between the collective aspirations and the individual needs of its constituents. This was followed by Lembar (0.80) and Narmada (0.68). The congruence between the group's goals and personal objectives also exhibited significant variation across regions, with Gunung Sari (0.73) demonstrating the highest level of congruence, followed by Narmada (0.68) and Lembar (0.54) showing the lowest level of congruence (Figure 2). The low index in Lembar reflects a misalignment between the group's vision and the individual expectations of its members, which may hinder their active participation.

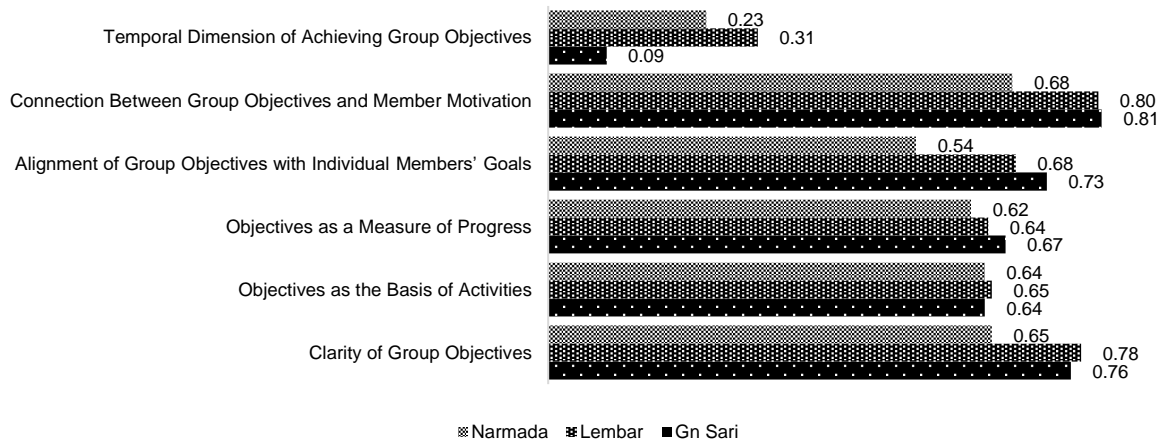


Figure 2. Elements of Group Objectives

The dimension of time in goal achievement recorded the lowest indices across all locations, with Narmada having the lowest value (0.09), followed by Lembar (0.23) and Gunung Sari (0.31). This index reflects the group's limited ability in time-based planning, which hinders the group from evaluating progress and measurably achieving targets. The time scarcity according to Scheyett *et al.* (2025) is exacerbated by the demanding nature of agriculture, which requires attention with the result that there is little space left for planning and evaluation activities. Conversely, the objective as the basis for activities and a measure of progress demonstrated more consistent indices across the three locations (ranging from 0.62 to 0.67), signifying that this aspect is reasonably well understood, though not fully optimized.

Overall, Gunung Sari demonstrated excellence in aligning goals with members' motivations and their individual needs. Lembar, in contrast, exhibited strength in the clarity of the group's objectives. Conversely, Narmada encountered challenges across a wide range of domains, particularly in the domains of planning and communication. This finding underscores the necessity for interventions to enhance group

effectiveness in achieving its goals as analyzed by Slayi *et al.* (2023) on the case of rural farmers in South Africa.

Structure of the Group. In terms of group facilities and infrastructure, Narmada demonstrated the highest index (0.48), followed by Lembar (0.43) and Gunung Sari (0.34). This suggests that Narmada is more effective in providing the necessary facilities to support group activities, while Gunung Sari encounters challenges in this regard. The analysis of group rules revealed a similar trend, with Gunung Sari achieving the highest index (0.71), followed by Lembar (0.65) and Narmada (0.47) (Figure 3). This finding suggests that Gunung Sari has a more structured and consistent set of rules, which contributes to operational stability in line with the analysis of Sugiarto and Cahyo (2025) on the Cattle-Farmer Group in Kebumen. With regard to solidarity within the group, both Narmada and Gunung Sari recorded identical indices (0.74), indicating strong social bonds at both locations. In contrast, Lembar exhibited a slightly lower index (0.72), indicating the necessity for further enhancement of its social relationships among members.

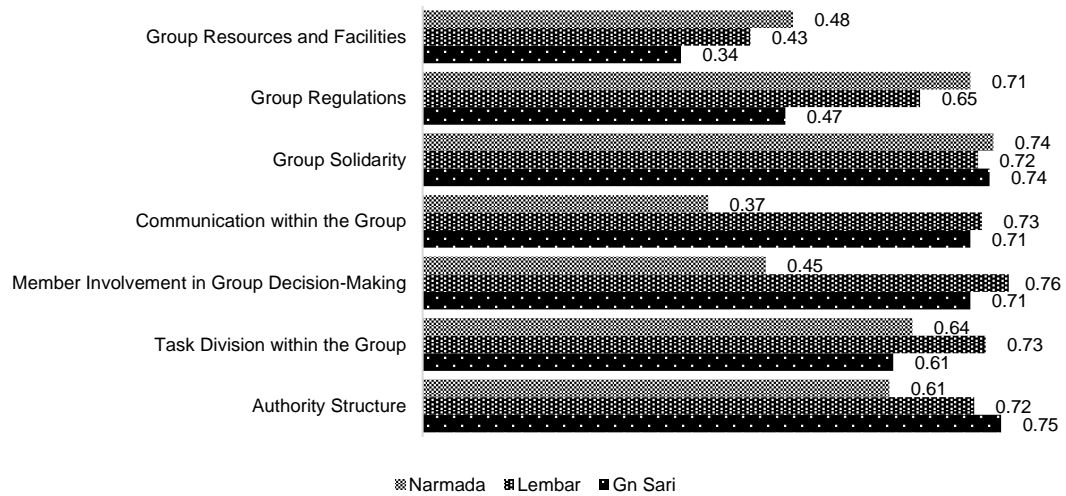


Figure 3. Elements of the structure of the Group

Regarding communication within the group, Lembar demonstrates a high level of efficacy, with an index score of 0.73, followed by Gunung Sari (0.71) and Narmada (0.37). The latter's lower index score suggests challenges in information dissemination, which can impede member coordination (Abdullah *et al.*, 2022; Ssekibaala *et al.*, 2024). With regard to member involvement in decision-making, Lembar once again achieves the highest index (0.76), followed by Gunung Sari (0.71) and Narmada (0.45). This finding suggests that Lembar demonstrates a more practical approach in actively engaging members in decision-making, while Narmada encounters difficulties in ensuring inclusive participation. Concerning task distribution within the group, Lembar once again recorded the highest index (0.73), followed by Narmada (0.64) and Gunung Sari (0.61). This indicates that task allocation in Lembar is more balanced, while Gunung Sari needs to improve task distribution to ensure fairness.

The authority structure recorded the highest index in Gunung Sari (0.75), followed by Lembar (0.72) and Narmada (0.61). This finding suggests that Gunung Sari is more successful in defining and distributing member roles and responsibilities. In conclusion, Lembar demonstrates excellence in member involvement, communication, and task division, while Gunung

Sari exhibits proficiency in authority structure and group rules. Conversely, Narmada demonstrated strengths in terms of facilities and infrastructure, yet exhibited deficiencies in communication and member engagement, underscoring the need for focused efforts to enhance the group's collective efficacy, as the views of (Mzimela and Moyo, 2025).

Functions and Tasks Element. Lembar demonstrates proficiency in the domains of internal communication, as evidenced by its attainment of the highest indices in the dissemination of internal activity information (0.77) and information and technology dissemination (0.61) (Figure 4). This observation signifies the group's ability to manage information flow, effectively fostering coordination and member participation (Kavad *et al.*, 2024). In comparison, Gunung Sari attained second position in both aspects (0.68 and 0.42), while Narmada recorded the lowest indices (0.49 and 0.38), indicating limitations in conveying relevant information and technology to members. With regard to coordination, both Gunung Sari and Lembar achieved the highest index (0.75), indicating strong capabilities in integrating group activities. Narmada, with an index of 0.68, demonstrates adequate coordination, though it is evident that further enhancement is necessary to attain a level of effectiveness commensurate with the other sites.

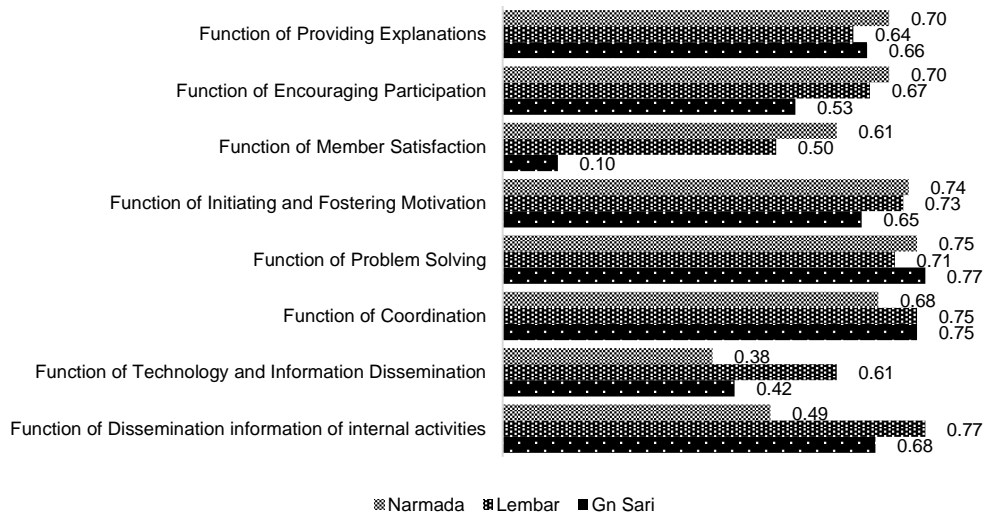


Figure 4. Elements of Functions and Tasks

Gunung Sari is the best at problem-solving (0.77), and Lembar and Narmada are tied for second (0.75). Narmada is the most initiative-driven (0.74), and Lembar is the most motivated (0.73). Gunung Sari's index of 0.65 shows the need for efforts to promote active engagement. Narmada leads member satisfaction with 0.61, followed by Lembar at 0.50. Gunung Sari has the lowest score (0.10), showing the need to improve member satisfaction with group activities. Gunung Sari's highest score (0.77) shows the group's ability to solve conflicts and find collective solutions. Lembar and Narmada are tied for second (0.75), showing good ability but less than Gunung Sari. Narmada is most proactive (0.74), followed by Lembar (0.73). Gunung Sari has a lower index (0.65), showing the need to promote active contributions. Narmada is best for member satisfaction (0.61), followed by Lembar (0.50). Gunung Sari is the worst (0.10), showing the need to improve activities.

Encouraging member participation demonstrates Narmada's superiority (0.70), reflecting success in actively engaging members, while Lembar ranks second (0.67). In contrast, Gunung Sari records the lowest index (0.53), indicating the need for tangible efforts to enhance member involvement in group activities. About the provision of explanations, Narmada once again achieves the highest index (0.70), followed by

Gunung Sari (0.66) and Lembar (0.64), which are in the lowest position. Overall, Lembar demonstrates excellence in internal communication and coordination. Narmada leads in initiative, motivation, and member satisfaction, while Gunung Sari requires attention to enhance participation and satisfaction to improve group effectiveness. These results underscore the notion that the functions and tasks of a group are pivotal in fostering a harmonious and sustainable group dynamic (Sugiarto *et al.*, 2024; Suryalena *et al.*, 2025).

Coaching and Development Element.

Narmada is highly proficient in encouraging participation, as shown by its highest possible index (0.79). Lembar achieves a good second place with an index of 0.73, while Gunung Sari needs to improve with an index of 0.59, showing the need for better ways to encourage participation to enhance group dynamics (Rustinsyah, 2019; Baharuddin *et al.*, 2024; Kavadi *et al.*, 2024). Lembar is at the top for facilities for group activities (0.56), followed by Gunung Sari (0.51) and Narmada (0.47) (Figure 5). Narmada's low ranking is due to limited facilities affecting activity effectiveness. Narmada and Lembar are equally effective at organizing group activities, but Gunung Sari is less effective, suggesting improvements need to be made.

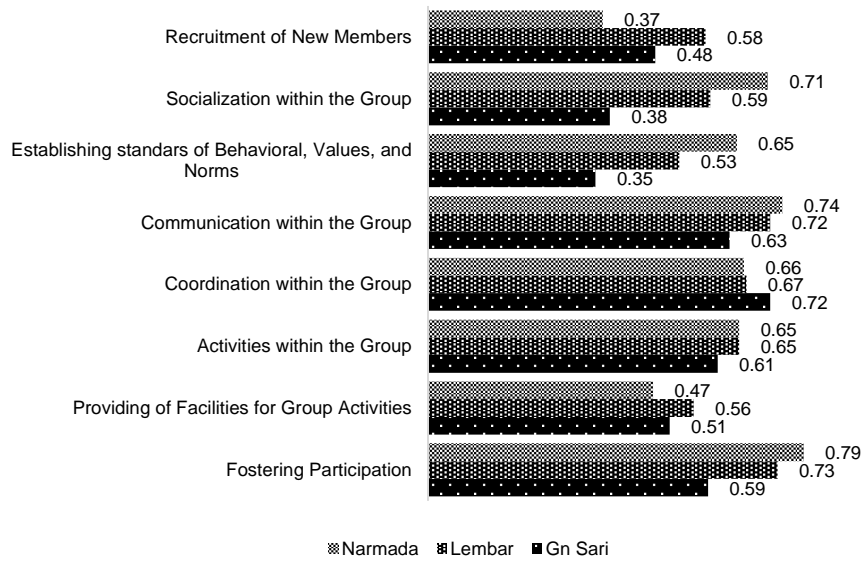


Figure 5. Element of Coaching and Development

The highest coordination index was recorded in Gunung Sari (0.72), indicating the group's capacity to integrate activities and foster synergy among its members. Lembar exhibits an index of 0.67, while Narmada, though slightly lower at 0.66, demonstrates commendable coordination. With regard to communication, Narmada achieves the highest index (0.74), followed by Lembar (0.72) and Gunung Sari (0.63). The elevated standing of Narmada indicates the group's efficacy in disseminating information and the sustenance of interaction among its members. Conversely, Lembar and Gunung Sari are identified as areas requiring enhancement of their respective communication strategies to foster enhanced group dynamics. Concerning the establishment of behavioral standards, values, and norms, Narmada once again leads with an index of 0.65, while Lembar records an index of 0.53, and Gunung Sari is lower (0.35), indicating the need for a more systematic approach in Gunung Sari to strengthen group cohesion.

In terms of the socialization process, Narmada once again emerged as the leading group with an index of 0.71, thus demonstrating its effectiveness in instilling values and norms among its members. Lembar ranked second with an index of 0.59, while Gunung Sari recorded a lower index of 0.38, thus highlighting the need for strengthened socialization efforts to improve social cohesion (Firmanto *et al.*, 2024; Gandasari *et al.*, 2024). With regard to the recruitment of new members, Lembar demonstrated the highest index (0.58), followed by Gunung Sari (0.48). Conversely, Narmada

exhibited the lowest index (0.37), indicating the necessity for a more innovative approach to attract new members.

Overall, Narmada's strengths lie in communication, socialization, and participation, reflecting its success in fostering strong member engagement, as the findings and analysis of previous researchers (Jaya and Sarwoprasodjo, 2024; Suryalena *et al.*, 2025). Lembar has demonstrated notable proficiency in facility provision and member recruitment, which is essential for supporting group growth. While proficient in coordination, Gunung Sari needs to focus on improving other areas to enhance the overall effectiveness of group development and coaching.

Group cohesiveness element. The Narmada group demonstrates a high level of cohesiveness, as evidenced by its top-ranked indices in unity/cohesiveness (0.84) and belonging, trust, respect, and love (0.86). These results suggest that the group is particularly adept at fostering solidarity and cultivating strong interpersonal relationships among its members (Shidqi *et al.*, 2023). The Lembar group, with indices of 0.77 and 0.72, respectively, demonstrates that while its social relationships are well-maintained, they do not reach the levels observed in Narmada. The lower indices for Gunung Sari (0.67 and 0.69) underscore the necessity for interventions aimed at strengthening emotional bonds between members, thereby enhancing overall group cohesion (Figure 6).

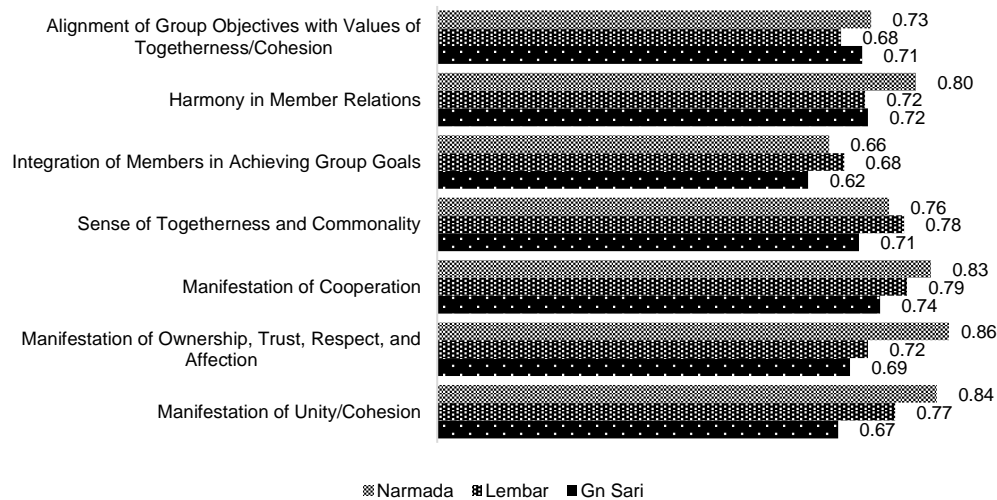


Figure 6. Elements of Group Cohesiveness

In terms of the manifestation of cooperation, Narmada once again demonstrated a high level of effectiveness in collaborative endeavors, as evidenced by its index of 0.83. Lembar exhibited a commendable index of 0.79, signifying robust member coordination. Conversely, Gunung Sari exhibited an index of 0.74, indicating the necessity for enhanced collaboration strategies to foster cohesion among its constituents. In terms of the sense of community and commonality, Lembar demonstrated the most substantial index (0.78), indicating its capacity to foster a sense of egalitarianism and unity in line with findings and analysis related to the social capital of farmers by (Suryalena *et al.*, 2025). Narmada followed with an index of 0.76, while Gunung Sari exhibited the lowest index (0.71), underscoring the necessity for a more strategic approach to enhance cohesion. The aspect of harmonious relations between members demonstrated the highest index in Narmada (0.80), indicating enhanced stability of social relations in comparison to other locations. Lembar and Gunung Sari exhibited an identical index (0.72), suggesting the potential for enhancement of the quality of relationships between members.

With regard to the degree of cohesiveness among members in achieving group objectives, Lembar demonstrated an index of 0.68, followed by Narmada (0.66), while Gunung Sari exhibited the lowest level of cohesiveness (0.62). This suggests that Gunung Sari continues to encounter difficulties in aligning the visions and contributions of its members to achieve collective goals. Overall, Narmada exhibited strengths in

nearly all aspects of cohesiveness, while Lembar demonstrated particular excellence in terms of a sense of community. Gunung Sari requires enhancement in interpersonal relationships and cohesiveness to invigorate group dynamics.

Group Atmosphere Element. The aspect of group disruption has the highest index in Narmada (0.85), indicating significant internal barriers in comparison to other locations. Lembar demonstrated an intermediate position with an index of 0.64, while Gunung Sari exhibited the lowest score (0.59), suggesting enhanced group stability in this regard (Figure 7). Conditions in Narmada necessitate more significant attention to mitigate disruption, whereas Gunung Sari has effectively maintained group dynamics. In terms of the atmosphere of relationships among members, Narmada once again exhibited the highest level of harmony (0.88), indicating the presence of harmonious interpersonal relationships among members (Sugiarto *et al.*, 2024). Lembar ranked second (0.80), while Gunung Sari recorded an index of 0.64, indicating the necessity for enhanced social interaction in these locations. The aspect of a sense of freedom demonstrates that Lembar has the highest index (0.79), followed by Gunung Sari (0.78), while Narmada is lower (0.68). This suggests that Lembar and Gunung Sari members feel they have more space to express themselves than in Narmada. Baharuddin *et al.* (2024) highlight that factors such as age and experience in farming significantly affect farmers' motivation which relate to the farmers autonomy in making decisions related to cattle farming that contributes to their sense of freedom.

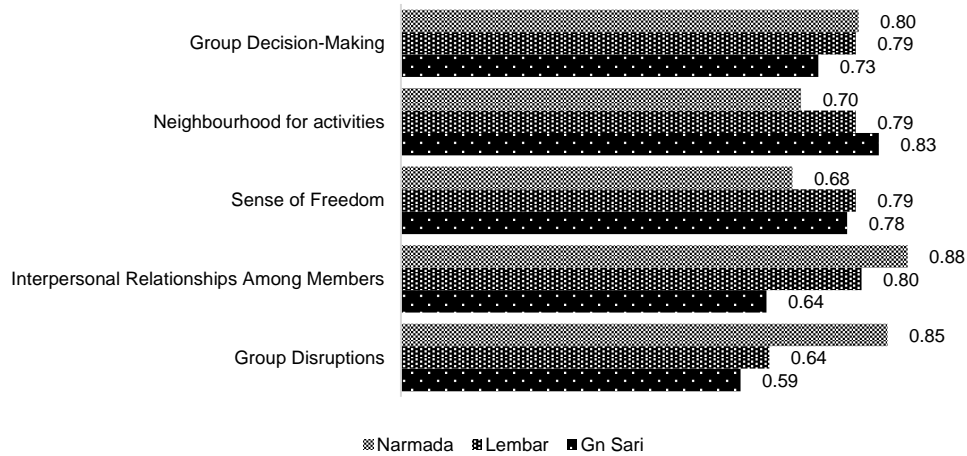


Figure 7. Elements of Group Atmosphere

With regard to the working environment, Gunung Sari demonstrated the highest level of productivity (index: 0.83), indicating an atmosphere conducive to productivity. Lembar ranked second (index: 0.79), while Narmada recorded an index of 0.70, suggesting the necessity for enhanced facilities or work environments in these locations. The character building of farmers, including innovation and upskilling is important to increase productivity with the support of community networks for access to resources and information (Suryalena *et al.*, 2025).

In terms of group decision-making, Narmada demonstrated its superiority with an index of 0.80, signifying a more structured decision-making process that engages all members. Lembar ranked second with an index of 0.79, while Gunung Sari ranked lowest (0.73), underscoring the necessity for enhanced member participation in decision-making. The analysis indicates that Narmada is proficient in fostering harmonious relationships and effective decision-making processes. In contrast, Gunung Sari exhibits a distinct strength in its activity environment, while Lembar exhibits notable resilience in freedom and stability within social relationships.

Group Pressure Element. In terms of internal conflict and competition, Lembar exhibited the most intricate internal dynamics, as reflected by its highest index of 0.52. This suggests that Lembar faces more complex internal dynamics than the other two locations. Conversely, Gunung Sari demonstrated the least complex internal dynamics, as evidenced by its lowest index of 0.46. The higher indices observed in Lembar and Narmada highlight the need for more effective conflict resolution strategies to maintain group stability, while Gunung Sari appears more capable of preserving harmony among its members. Communication structures in farmer groups can facilitate or hinder conflict resolution, as found by (Gandasari *et al.*, 2024), who identified that low connectivity and weak coordination are obstacles to effective communication and conflict management.

Regarding competition with other groups, Narmada emerged as the leader, with an index of 0.66, reflecting the significant external competition it faces. Lembar holds an intermediate position with an index of 0.32, while Gunung Sari recorded the lowest index of 0.24, indicating that this group is subjected to relatively less external pressure. The elevated index in Narmada suggests that the group may face considerable challenges in sustaining its competitiveness, while the lower external pressure in Gunung Sari allows the group to focus more on internal dynamics without significant external interference. Competition between cattle farmer groups is shaped by economic, socio-political, and partnership factors, including their relation to government policies that are not entirely favorable so that it has an impact on their competitive position (Yulianti *et al.*, 2024). In addition, the lack of knowledge about forage feed processing limits their ability to optimize resources and compete effectively (Amir *et al.*, 2024).

In terms of group challenges to achieving goals, Lembar again recorded the highest index (0.52), indicating significant obstacles that must be overcome to accomplish group objectives. Narmada secured second place with an index of 0.47, while Gunung Sari showed the lowest index (0.31) (Figure 8), suggesting that the groups in these locations face fewer challenges in achieving their goals. Regarding rewards and sanctions, Lembar once again excelled with an index of 0.69, reflecting a more systematic use of reward and sanction mechanisms to maintain discipline and motivate members. Narmada ranked second with an index of 0.55, while Gunung Sari recorded an index of 0.54, indicating that these two locations employ similar strategies in managing rewards and sanctions. In cattle farmer groups, rewards and sanctions are crucial in fostering cooperation and ensuring that members adhere to group norms. Rewards, such as recognition or material incentives, are effective when they align with the group's goals, while sanctions, including social pressure or fines, help maintain discipline and

encourage compliance with collective agreements (Piñeiro *et al.*, 2020).

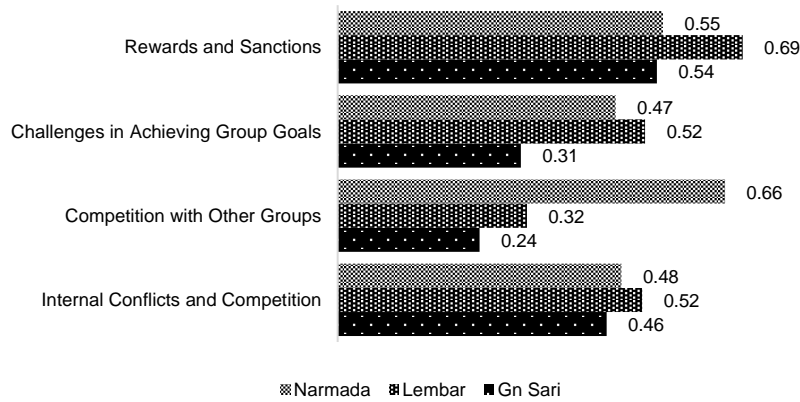


Figure 8. Elements of Group Pressure

The Lembar group is subject to high internal and external pressures, yet it demonstrates superior mechanisms for managing rewards and sanctions. Narmada is characterized by intense external competition, while Gunung Sari exhibits better stability and faces fewer internal and external challenges. The distinct approaches observed in these groups highlight the need to tailor management strategies according to each group's specific pressures. The following are some aspects identified as the pressure factors of cattle farmers groups in Indonesia, namely: internal pressures: management and finance (Jubaedah *et al.*, 2024), human resources (Rohani *et al.*, 2024), cattle farming efficiency (Saefullah *et al.*, 2024), external pressures include market dynamics (Jubaedah *et al.*, 2024), technology (Umboh *et al.*, 2024), and climate change (Saefullah *et al.*, 2024).

Group Effectiveness Elements. With regard to the group's purpose, the highest indices were recorded by Gunung Sari and Lembar (0.80), indicating their capacity to harmonize members' visions. Conversely, Narmada (0.64) necessitates

enhanced communication to ensure all members comprehend the group's direction. The analysis of idea exchange revealed Gunung Sari's proficiency in fostering interactions among members, evidenced by an index of 0.78. Lembar (0.75) exhibits a slightly lower performance in this regard, while Narmada (0.69) demonstrates a need for enhancement to foster more active exchange of ideas. Concerning the distribution of responsibilities, Lembar (0.76) exhibits the highest index, indicating a well-structured division of tasks, while Gunung Sari (0.60) and Narmada (0.58) demonstrate potential for improvement in responsibility distribution (Figure 9). Social capital is essential for the effective functioning of cattle farmer groups, including trusts, norms, relationships, and networks that facilitate cooperation and collective action. Sugiarto *et al.* (2024) concluded that groups with 15-20 members tend to have high social capital as well as improve their ability to align members' visions and work towards common goals.

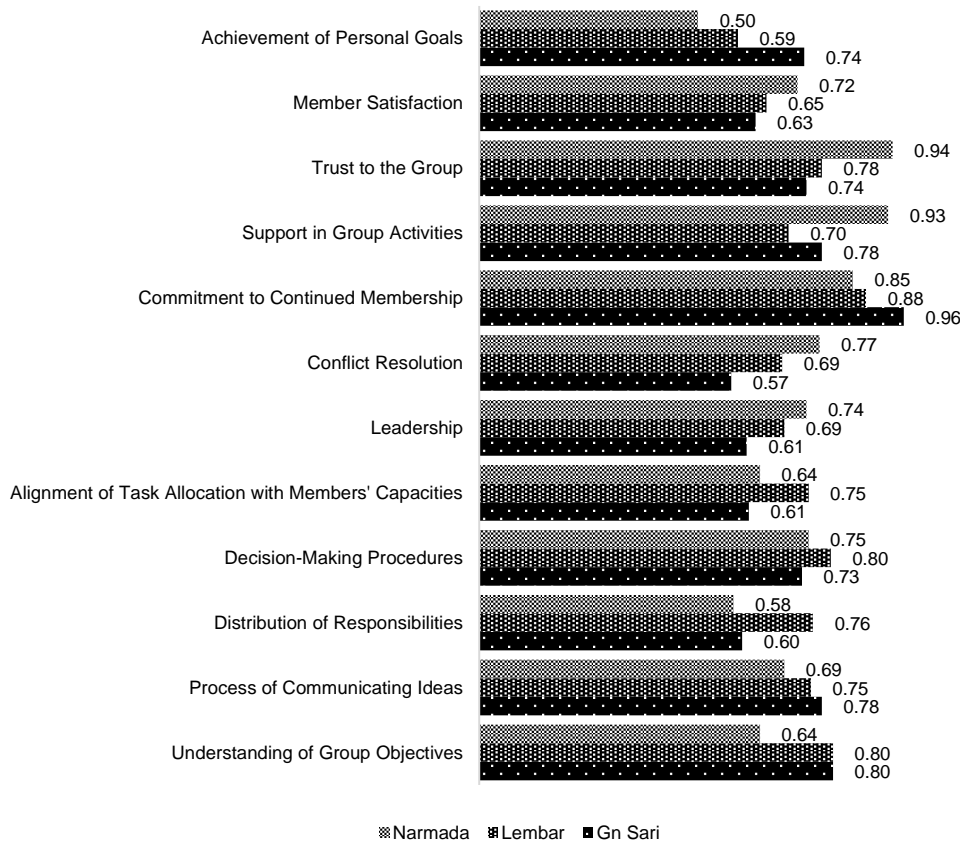


Figure 9. Elements of Group Effectiveness

In terms of the decision-making procedures, Lembar once again demonstrated excellence (0.80), indicating an inclusive and organized decision-making process. Narmada (0.75) and Gunung Sari (0.73) followed, exhibiting a commendable capacity to engage members. Such inclusive processes allow members to feel represented and enhance the sense of ownership, essential for motivating participation and sustaining long-term engagement (Mwambi *et al.*, 2020). The alignment of tasks with members' capabilities also positioned Lembar at the pinnacle (0.75), signifying a nuanced comprehension of individual competencies. Conversely, Narmada (0.64) and Gunung Sari (0.61) needed enhancement in aligning tasks with members' capabilities. Aligning tasks with members' capabilities fosters a strategic decision-making environment where members are optimally engaged according to their skills, thus strengthening the overall group dynamics and productivity (Taramuel-Taramuel *et al.*, 2023). In leadership, Narmada stood out with an index of 0.74, signifying effectiveness in leading and motivating members. Lembar (0.69) and Gunung Sari (0.61) necessitated enhancement in this aspect.

In terms of conflict resolution, Narmada has the highest index of 0.77, indicating proficiency in managing differences and devising mutually acceptable resolutions. Lembar (0.69) exhibits a

similar capability, while Gunung Sari (0.57) necessitates a more strategic approach to internal conflict management. This is reflected in the dynamics of cattle farmer groups where, as noted by (Abdullah and Mustabi, 2025), effective conflict resolution can significantly enhance group performance by fostering cooperation and trust among members. Gunung Sari shows the highest recorded loyalty (0.96), signifying a profound sense of attachment among members. Lembar (0.88) and Narmada (0.85) continue to demonstrate commendable levels of engagement, underscoring their commitment to collective endeavours.

An effective communication structure within a group of farmers is important for maintaining active engagement and smooth coordination because often the ineffectiveness of communication patterns inhibits group loyalty and collective action (Gandasari *et al.*, 2024). With an index of 0.93, Narmada emerges as a leader in terms of support for group activities, reflecting robust solidarity and cooperation. This is followed by Gunung Sari (0.78) and Lembar (0.70), which also exhibit notable levels of group support. Leadership focuses on empowering farmer group members through accessibility, independence, and participation to increase productivity and income. This is closely related to the leader's ability to manage resources and guide the group effectively (Supriadi *et al.*, 2023).

In terms of group cohesion, Narmada demonstrated the highest mean score (0.94), indicating the presence of robust and profound connections among its members. Lembar (0.78) and Gunung Sari (0.74) demonstrated commendable levels of trust, though they did not reach the same level as Narmada. Narmada also showed the highest level of member satisfaction (0.72), indicating a higher level of comfort and satisfaction than Lembar (0.65) and Gunung Sari (0.63). With an index of 0.74, Gunung Sari demonstrates a high level of personal goal achievement, indicating the group's efficacy in supporting members' individual needs. Conversely, Lembar (0.59) and Narmada (0.50) necessitate a more targeted approach to enhance support for members' achievement.

Overall, Narmada demonstrates particular strengths in support, trust, and leadership. In contrast, Gunung Sari is distinguished by its notable member loyalty and proficiency in individual achievement. Lembar, on the other hand, exhibits excellence in task sharing and efficient decision-making. Encourage positive conformity and solidarity (Efendi and Sasmita, 2024). Meanwhile, member satisfaction is closely related to the group's ability to meet individual needs and provide a supportive environment, as shown by the role of farmer groups as a means of learning,

cooperation, and the distribution of aspirations (Irwan, 2024). The efficacy of a group in supporting individual needs is reflected in its ability to improve the well-being and productivity of members (Suryalena *et al.*, 2025).

Group dynamics index (GDI) cumulative

The following matrix displays the group dynamics index (Table 5), which has been calculated based on the eight main elements, with the weight of each component being considered. The cumulative index provides an overall picture of the comparative level of group dynamics in Gunung Sari, Lembar, and Narmada. This data provides an essential basis for analyzing the strengths and weaknesses of the groups in each location and identifying priorities for improvement that can support group sustainability and effectiveness more optimally. As highlighted in studies of smallholder cattle farming in Indonesia, such as those by (Hilmiati *et al.*, 2024; Rohaeni *et al.*, 2024), aligning group dynamics with effective resource management, leadership, and conflict resolution is crucial for achieving long-term sustainability. Analyzing the components of group dynamics, particularly in cattle farmer groups, allows for identifying key leverage points where interventions can be made to enhance productivity and well-being.

Table 5. Group Dynamics Index Cumulative

Elements	Index			Weight	Score x Weight		
	Gn. Sari	Lembar	Narmada		Gn. Sari	Lembar	Narmada
Group Objectives	0.61	0.64	0.56	0.18	0.11	0.11	0.10
Group Structure	0.62	0.68	0.57	0.14	0.09	0.10	0.08
Task Function	0.48	0.67	0.63	0.11	0.05	0.07	0.07
Coaching & Development	0.46	0.63	0.63	0.11	0.05	0.07	0.07
Group Cohesiveness	0.69	0.73	0.78	0.14	0.10	0.10	0.11
Group Atmosphere	0.71	0.76	0.78	0.14	0.10	0.11	0.11
Group Pressure	0.40	0.51	0.54	0.07	0.03	0.04	0.04
Group Effectiveness	0.71	0.73	0.73	0.11	0.08	0.08	0.08
Cumulative Index					0.60	0.68	0.65

The cumulative index has ranked Lembar as the location with the most optimal group dynamics (0.68). This is supported by Lembar's demonstrated excellence in several key elements, such as group structure, where the division of tasks, rules, and members' involvement in decision-making work well. In addition, Lembar has managed members' roles efficiently in the task function, thereby increasing participation. The efficacy of Lembar's decision-making procedures is further evidenced by its organized process and active involvement of all members, which culminates in more stable and efficient group dynamics than those observed in other locations. This aligns with findings from various studies on the importance of group cohesion and the role of leadership in fostering an inclusive environment (Haryadi *et al.*, 2019). Effective decision-making, fosters commitment to shared goals and encourages active participation, both of which are crucial for enhancing group stability and adopting sustainable practices (Rustinsyah, 2019). Furthermore, group activities play a critical role in

reinforcing cohesion and ensuring continued engagement, as observed in the practices of Lembar where active participation and the management of tasks in alignment with members' capabilities are prioritized (Haryadi *et al.*, 2019).

Meanwhile, Narmada (0.65) demonstrates relatively robust group dynamics, particularly regarding group cohesiveness and atmosphere. Groups in Narmada exhibit harmonious interpersonal relationships, robust collective support, and mutual trust among members. This is reflected in the high cohesiveness index, which is supported by a sense of togetherness and cooperation in achieving common goals. However, the aspect of group goals demonstrates a weakness, with an index of only 0.56. This deficiency in aligning members' visions with group objectives hinders the group's capacity to function synergistically. Additionally, the task function index for Narmada was lower than that of the other two locations, indicating a need for enhanced management of roles and responsibilities among members.

As highlighted in several studies (Baharuddin *et al.*, 2024; Suryalena *et al.*, 2025), cohesive group dynamics, such as strong interpersonal trust and collective support, are essential for motivating farmers and increasing their engagement in group activities. These dynamics not only enhance communication and problem-solving but also improve collective decision-making, which is crucial for the success and longevity of farmer groups. In Narmada, the robust atmosphere of cooperation could serve as a foundation for addressing weaknesses in aligning group goals and improving task function management, as fostering an inclusive and supportive environment has been shown to lead to better coordination and more effective role management within groups (Baharuddin *et al.*, 2024). Therefore, while group cohesiveness is a strength, refining goal alignment and optimizing task management would help maximize the group's potential and improve its dynamics.

In the last position, Gunung Sari (0.60) indicates significant challenges in maintaining group dynamics; however, the group demonstrates particular strengths in terms of group atmosphere, especially in relation to the environment of activities and the sense of freedom experienced by members in carrying out their roles. This suggests creating a supportive and flexible working environment for members. The data indicates an intense desire among members to continue their participation, with an index of 0.96, suggesting high levels of member loyalty to the group. However, the analysis also reveals significant weaknesses in the elements of task function (0.48) and group pressure (0.41). The low task function index highlights the need for enhanced internal management to ensure effective division of responsibilities, while the weak group pressure index suggests that reward and sanction mechanisms require further refinement.

Sugiarto *et al.* (2024) and Baharuddin *et al.* (2024) addressed that creating a positive group atmosphere and fostering member loyalty are crucial for long-term success. However, groups may struggle with coordination without clear task functions and well-defined roles, leading to inefficiencies. Furthermore, weak group pressure and poorly implemented reward mechanisms, as showed in Gunung Sari, can undermine motivation and reduce the overall effectiveness of the group. Strengthening task management and refining reward and sanction systems would enhance the group's ability to achieve its objectives and ensure better participation and accountability among members.

The results of the study indicate that Lembar demonstrates particular proficiency in the domains of structure, task function, and decision-making, thus establishing itself as the location that exhibits optimal group dynamics. On the other hand, Narmada demonstrates notable strengths in group cohesiveness and support among its members. However, Narmada needs to enhance

its efficiency in achieving group objectives and executing task functions. Significant improvements to internal management are required to increase overall efficiency in Gunung Sari despite the high levels of member loyalty and a conducive working atmosphere. It is recommended that strategies to enhance each location be customized to target the particular strengths and weaknesses of each element of group dynamics.

Improving group structure and management is essential for better performance (Abdullah and Mustabi, 2025). Lembar's ability to align task functions with member capabilities suggests the importance of optimizing task division and leadership strategies, which can be replicated in Narmada and Gunung Sari. In Narmada, while group cohesiveness is a strength, refining group goals and task management clarity will drive better outcomes. The importance of building strong social capital and internal cooperation highlights the need for Narmada to strengthen internal coordination and enhance performance (Rustinsyah, 2019). Moreover, in Gunung Sari, creating a flexible yet structured environment and more effective reward and sanction systems could increase its overall operational effectiveness, ensuring that high member loyalty translates into more productive group activities (Gandasari *et al.*, 2021).

However, group dynamics theory should be developed with a more integrated approach to enhance understanding, encompassing structural and non-structural elements within a holistic framework. Subsequent models should incorporate relational dimensions. Trust and social support are pivotal to group cohesion and stability. The theory should also adapt to external changes to ensure relevance. Theoretical approaches should focus more on interactions between elements, such as how group goals and structures can support decision-making. Research should focus on developing predictive models capable of identifying critical elements in group dynamics so that empowerment strategies can be more adaptive and evidence-based.

As emphasized in various studies, including those by Suryalena *et al.* (2025) and Sugiarto and Cahyo (2025), integrating social capital within group dynamics is crucial for fostering cooperation and improving group performance. Social capital—comprising trust, social networks, and shared norms—supports better decision-making and resource sharing, ultimately enhancing group stability and productivity. Furthermore, focusing on external changes, such as market demands or environmental conditions, can help develop more adaptive models for farmer groups, ensuring that the group dynamics remain robust in the face of new challenges (Sugiarto *et al.*, 2024). Manzano *et al.* (2021) noted that a holistic, transdisciplinary approach is essential for understanding the complexities of group dynamics in pastoral and farming communities, ensuring that the interactions between social, economic, and environmental dimensions are properly addressed.

The proficiency in structure, task function, and decision-making observed in Lembar farmer groups can be directly leveraged to optimize beef farming operations. Efficient decision-making and clear task delegation contribute to better herd management, feed allocation, and resource use, leading to improved productivity. As noted in studies on farm management, effective decision-making is linked to improved farm outcomes, where structured processes help in the efficient allocation of resources and better performance (Taramuel-Taramuel *et al.*, 2023).

In the case of Narmada, there is a need to enhance task execution and efficiency, and there is a space for improvement in operational aspects such as livestock health monitoring, breeding programs, and marketing strategies. Abdullah *et al.* (2022) highlight that improving managerial capacity, particularly in task execution, is crucial for overcoming barriers to innovation adoption and ensuring sustainability in beef cattle farming. Addressing these gaps could significantly boost beef production and profitability. Lastly, improving internal management in Gunung Sari could lead to better organization of labour, timely disease control, and improved logistical planning, thereby enhancing the overall efficiency of beef farming. Sugiarto and Cahyo (2025) argue that strengthening internal management systems and leveraging social capital within the group can play a pivotal role in enhancing cooperation and driving operational efficiency, ultimately contributing to the sustainability of beef cattle farming in rural areas.

Conclusion

This study emphasizes that group dynamics result from the complex interaction between structural elements, such as task management and decision-making, and non-structural elements, such as cohesion and the group atmosphere. A group's success depends on the strength of individual components and the harmony of these elements. Imbalance can lead to weakened cohesion, reduced effectiveness, or difficulty achieving goals. A holistic approach that integrates the strengths and weaknesses of structural and social aspects is needed to achieve optimal group dynamics. Task division, communication, and the clarity of collective objectives influence the role of group members. Groups combining solid interpersonal relationships with efficient operational mechanisms are more likely to succeed. Ideal group dynamics are achieved by synergistic interactions that support social and operational continuity and enable groups to adapt and succeed in various situations. By prioritising this integration, farmer groups and similar organizations can enhance their functionality, resilience, and sustainability.

This study makes several recommendations for the government to strengthen cattle farmer groups in West Lombok. First, the government should encourage youth

involvement by offering incentives and educational programs. Second, train group leaders and members to improve management and leadership. Third, sustainability indicators should be promoted to assess viability and improvements. The Group Dynamics Index (GDI) could be helpful. Lastly, the government should make resources, modern technologies, and infrastructure easier to access. Also, provide financial support for small-scale farmers to invest in these areas. Researchers should focus on long-term studies and explore social capital's role in group performance. Further studies should consider how gender and inclusivity affect leadership and participation. This ensures inclusive policies.

Conflict of interest

No potential conflict of interest relevant to this article was reported. All authors have agreed with the contents of the manuscript.

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Author's contribution

The authors confirm their contribution to the paper as follows: study conception and design: MT, RAV; data collection: MT, RAV, AF; analysis and interpretation of results: MT, AF, RAP, H, IGLM, MN; draft manuscript preparation: MT, RAP, AF, MN, H, RAV.

Ethics approval

This article does not involve animal subjects, so ethical approval for animal studies is unnecessary in the present study.

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