Indian J Dairy Sci 78(6): 586-591
https://doi.org/10.33785/IJDS.2025.v78i06.013

RESEARCH ARTICLE

Comparative Analysis of Group Dynamics across Developmental stages of Dairy-Based Farmer Producer Organizations in Karnataka

Dayananda Patil[1], MC Arunmozhi Devi[1](✉), Somasekaran Subash[1], Hans Ram Meena[2], Muniandy Sivaram[3], Shivaswamy GP[3] and Jeyakumar Sakthivel[4]

Received: 03 June 2025 / Accepted: 02 September 2025 / Published online: 23 December 2025

Abstract: Farmer Producer Organizations (FPO) aggregate smallholders to enhance bargaining power and facilitate access to inputs, credit, and markets. Acknowledging the centrality of group dynamics to the efficacy of FPO, this study was conducted in Karnataka with Ex Post Facto research design. Nine dairy based FPOs were selected, three each at Incubation, Growing, and Matured stages with randomly sampled 30 farmer members and 5 office bearers per FPO making a total sample size of 315 respondents. A twelve dimension index to measure group dynamics was developed. An F test and Duncan's Multiple Range Test revealed significant stage-wise differences in team spirit, decision making, cohesiveness, membership involvement, motivation, norms, and task functions, as well as overall dynamics. Correlation analysis indicated strong positive associations between group dynamics and education, FPO experience, landholding, income, economic motivation, risk orientation, extension participation, and herd size, whereas age, family size, and dairying experience were negligible. Understanding these variations in group dynamics can shape policies that enhance performance and sustainability of dairy FPO.

Key words- Group dynamics, Dairy FPO, Incubation, Growing, Matured

[1]Dairy Extension Section, Southern Regional Station ICAR-National Dairy Research Institute, Bengaluru, Karnataka 560 030, India

[2]Division of Extension Education, ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly, Uttar Pradesh 243122, India

[3]Dairy Economics & Statistics Section, Southern Regional Station ICAR-National Dairy Research Institute, Bengaluru, Karnataka 560 030, India

[4]Dairy Production Section, Southern Regional Station, ICAR-National Dairy Research Institute, Bengaluru, Karnataka 560 030, India
(✉)Email: deviram66@gmail.com

Introduction

India is predominantly agrarian, with animal husbandry underpinning its agricultural economy (Thakur et al. 2021). Nearly 100 million marginal, small and landless farmers—who account for about 90.00 percent of India's livestock output—also supply roughly 73.00 percent of the nation's milk (Leitch et al. 2014; Kumar et al. 2018). They struggle with inadequate feed and fodder, high input costs, limited extension and veterinary services, and low milk prices (Kumar & Parappurathu, 2014). Although cooperatives could alleviate many of these constraints, restrictive cooperative laws, bureaucratic control, elite capture, political interference and corruption have prevented cooperatives from becoming truly autonomous enterprises (Singh, 2019). In this context, FPOs have become vital instruments of collective action in India (Kujur et al. 2019). By legally uniting smallholders, they tackle fragmented landholdings, weak market bargaining power, and limited access to credit, inputs and technology, thereby improving value realization (Alagh, 2007; Venkattakumar et al. 2012). Backed by supportive regulations and expanding markets, FPOs are promoted at both central and state levels to farming into competitive agribusiness ventures (Mukherjee et al. 2018; Ajith, 2021).

Despite high initial enthusiasm, the formation and growth of FPOs across India have been uneven, and seen many struggles to achieve long term viability (Manaswi et al. 2018; Phansalkar & Paranjape, 2021). While some FPOs have demonstrated success, others falter midway. Such variability highlights a critical need to understand group dynamics of these organisations. Like all groups, FPOs tend to move through forming, storming, norming, and performing stages. Each stage calls for different leadership styles and interventions to guide the organisation toward high performance (Ajith, 2021).

The concept of group dynamics first articulated by Lewin (1936) and elaborated by Cartwright and Zander (1968), provides a useful lens to study the FPO group dynamics. Group dynamics encompasses the interdependencies among members, processes of social interaction, the formation of patterned relationships, and capacity of the group to bind individuals into a cohesive whole capable of achieving shared goals. Cohesiveness and

integration within a group are the primary forces that encourage members to stay engaged over time (Toseland & Rivas, 2009; Wageman, 2001).

Given that FPOs depend critically on member farmer participation in decision making, production activities, and collective negotiation, effective group processes are essential to FPO success (Ajith, 2021). With focus on the concepts and issues deliberated above, the study was conducted to analyse the group dynamics of dairy based Famer Producer Organisations of different development stages.

Materials and methods

Study Area and Research Design

Karnataka was purposively chosen as the study area owing to its robust performance in the dairy sector. According to a report by IMARC, "Dairy Industry in Karnataka: Market Size, Growth, Prices, Segments, Cooperatives, Private Dairies, Procurement and Distribution-2023" (2023), the dairy industry in the State was valued at INR 1,069.1 billion and is projected to reach INR 3,270.9 billion by 2032. This growth is attributed to the structured development of the sector and increasing consumer demand for value-added dairy products. Karnataka ranks prominently in the country in milk procurement & sales and hosts the second-largest dairy cooperative network nationwide. The study employed an Ex Post Facto research design. Dairy-based FPOs were analyzed based on their stages of organizational development, which were categorized into three distinct phases: 'Incubation', 'Growing', and 'Matured' phase. Each phase comprise specific institutional and financial requirements. During the Incubation Stage, FPOs primarily require support for member mobilization, registration, operational activities, training, and exposure visits, often facilitated through grants and institutional guidance. The Growing Stage necessitates access to equity financing, working capital and debt to enable scaling operations. In the Matured Stage, FPOs typically seek investment for value chain development and infrastructure enhancement.

From each of the three stages, three FPOs were purposively selected, with sample size of nine FPOs for the study. The selection criteria included: (1) the FPO major activity profile need to be dairying and registered under the Companies Act, 2013; (2) the FPO must be functioning for a minimum period of at least one year at the time of data collection; (3) FPO should have a profile of minimum of 100 active member dairy farmers during the study period; (4) the FPO must have filed its financial statements with the Ministry of Corporate Affairs (MCA) for the preceding fiscal year; and (5) the FPO must be actively functioning during the study period. The respondents included both farmer-members and professional office-bearers of the selected FPOs. Farmer-members comprised active dairy farmers who are shareholders in the FPOs and Office-bearers encompassed key personnel such as the Chief Executive Officer (CEO), Chairperson, Board Members, and other appointed staff of the FPOs. For each FPO, 30 farmer-members and 5 office-bearers were selected through random sampling, for a total sample size of 315 respondents.

Measurement and Data Collection

To assess the group dynamics among FPO members, a composite index was developed following the systematic protocol of index development encompassing twelve dimensions: participation, team spirit, group atmosphere, interest and motivation, decision-making procedures, group cohesiveness, leadership, empathy, task functions, interpersonal trust, group membership, and group norms. Relevant research data were collected using a structured interview schedule through face-to-face interviews. Quantitative data were analyzed using an F-test to determine statistical significance of group dynamics across the stages of FPOs. On observance of significant differences, Duncan's Multiple Range Test (DMRT) was applied to identify specific group differences. Furthermore, Karl Pearson's Correlation Coefficient was used to examine the relationship between respondents' socio-personal characteristics and their group dynamics, with all correlation coefficients tested for statistical significance.

Results and Discussion

Comparison of Group Dynamics dimensions across different stages of dairy based FPOs

a.Stability in Participation, Group Atmosphere, Group Leadership, Interpersonal Trust, and Empathy:

As presented in the Table 1, with respect to the comparison of the group dynamics dimensions, it was observed that, the consistent levels of participation (F value= 1.599), group atmosphere (F value= 0.250), group leadership (F value= 2.785), interpersonal trust (F value= 1.815), and empathy (F value= 1.508) across all three stages reveal that the select dimensions are adhered as the foundational structure and culture of the FPO. These dimensions often depend on pre-existing social capital, shared community identity, and mutual familiarity among members, particularly in rural settings. Once established during the incubation stage, the dimensions may remain relatively unaffected by organizational scaling or structural shifts. Trust and empathy, in particular, are interpersonal qualities that tend to be resilient and stable unless disrupted by major conflicts or crises. Similar observations were made by Gorai et al. 2023.

b.Stage-specific Variations in Team Spirit, Group Cohesiveness and Interest and Motivation:

Team spirit (F value= 4.002), group cohesiveness (F value= 14.431) and interest and motivation (F value= 4.231) were similar in the incubation and matured stages of FPOs, but differed significantly during the growing stage (Table 1). Relatively higher team spirit during the growing stage (mean= 23.54) was likely a consequence of increased member collaboration driven by the shared goal of

scaling operations. As FPOs expand, members may experience a renewed sense of purpose, which enhances group morale. However, as the organization reaches the matured stage, operational routines become more formalized, and individual roles may become more compartmentalized, leading to a decline in emotional bonding and team spirit. But group cohesiveness (mean= 13.09) was found lower during the growing stage which could reflect the internal tensions associated with organizational expansion. Rapid growth often introduces new members, shifts in leadership dynamics, and increased administrative complexity, all of which disrupt group unity. The above observations were in contrast with Gorai et al. (2023). While interest and motivation lowered during the growing stage (mean= 18.73) followed by a resurgence in the matured stage (mean= 20.09) due to uncertainty during growing stage, where members might question the organization's capacity to deliver benefits, only to regain confidence once stability and tangible outcomes are achieved. Singha, 2023 also reported similar results.

c. improvement in Decision-Making, Membership Involvement, Norms, and Task Functions:

With regard to the dimensions, decision-making (F value= 40.455) was found similar in the growing and matured stages of FPOs but differed significantly during the incubation stage (Table 1). The marked improvement in decision-making processes over time reflects the FPOs' progression toward institutional maturity. As FPOs gain experience, adopt better governance mechanisms, and enhance member awareness, they tend to move from top-down or promoter-driven decision-making toward more active participatory and democratic models. The findings were in contrast with Gorai et al. (2023).

Two dimensions, membership involvement (F value=50.044) and norms (F value=18.197) differed significantly across all the stage. Increase in membership was observed in the 'matured pahse' (mean= 17.83), with more active profile of members when they observed clear benefits and feel empowered to influence outcomes. Also, gradual strengthening of group norms indicates that institutionalization of behavior and expectations. In the early stages, norms are often informal and inconsistently applied. However, in the matured phase of FPOs, formal rules, codes of conduct, and procedures are established, improving predictability and coordination among members. These results are consistent with study of Gorai et al. 2023. Task functions exhibited a significant upward shift across developmental stages (F value/ =/ 86.992). Specifically, the incubation (mean=28.95) and growing stages (mean=30.06) did not differ significantly from one another, whereas the matured stage (mean=37.59) scored markedly higher, indicating that task execution effectiveness improves substantially as FPOs reach maturity. Matured FPOs are typically more proficient in planning, delegating, and executing tasks, leading to improved efficiency and goal attainment. The results were in contrast with Singha (2023).

Table 1: Comparison of Group Dynamics dimensions across different stage of dairy based FPOs

Dimension	Incubation (n_1=105)	Growing (n_2=105)	Matured (n_3=105)	F value
Participation	24.01 ± 0.36 ^{a}	24.98 ± 0.31 ^{a}	24.55 ± 0.47 ^{a}	1.599
Team Spirit	22.26 ± 0.36 ^{a}	23.54 ± 0.35 ^{b}	22.50 ± 0.31 ^{a}	4.002*
Group Atmosphere	19.53 ± 0.35 ^{a}	19.84 ± 0.31 ^{a}	19.54 ± 0.37 ^{a}	0.250
Decision Making	15.19 ± 0.36 ^{b}	18.29 ± 0.29 ^{a}	19.04 ± 0.30 ^{a}	40.455**
Group Cohesiveness	14.59 ± 0.34 ^{a}	13.09 ± 0.25 ^{b}	15.33 ± 0.31 ^{a}	14.431**
Group Leadership	21.19 ± 0.36 ^{a}	20.02 ± 0.35 ^{a}	20.69 ± 0.35 ^{a}	2.785
Interpersonal Trust	16.12 ± 0.33 ^{a}	16.30 ± 0.28 ^{a}	16.90 ± 0.30 ^{a}	1.815
Membership	13.67 ± 0.32 ^{a}	14.68 ± 0.24 ^{b}	17.83 ± 0.36 ^{c}	50.044**
Interest and Motivation	19.66 ± 0.34 ^{ab}	18.73 ± 0.29 ^{a}	20.09 ± 0.37 ^{b}	4.231*
Group Norms	16.36 ± 0.35 ^{a}	17.30 ± 0.29 ^{b}	18.82 ± 0.22 ^{c}	18.197**
Empathy	12.98 ± 0.29 ^{a}	13.54 ± 0.25 ^{a}	12.90 ± 0.32 ^{a}	1.508
Task Function	28.95 ± 0.49 ^{a}	30.06 ± 0.43 ^{a}	37.59 ± 0.57 ^{b}	86.992**
Overall	0.63 ± 0.003 ^{a}	0.65 ± 0.003 ^{b}	0.69 ± 0.003 ^{c}	56.689**

* Significant at 5% level, ** Significant at 1% level

(Mean values bearing similar superscript do not differ significantly)

d. Overall Group Dynamics:

The progressive increase in overall group dynamics from incubation (mean= 0.63) to matured phase (mean= 0.69) highlights the importance of organizational learning and adaptive capacity in FPOs. Incubation stage FPOs may lack clarity in structure and purpose, but over time, as they develop internal cohesion, stronger leadership, and operational routines, their group functioning becomes more effective. The above findings are inline with studies of Gorai et al. 2023; Garai and Maiti, 2020; Dewangan et al. 2019.

Correlation between independent variables and group dynamics of dairy based FPOs

Among demographic factors- age, family size, and dairying experience demonstrate non significant relation across all stages of FPOs (Table 2). Age, family size, and dairying experience showed minimal influence on FPO group dynamics. Age had weak negative correlations in the growing (r = –0.113) and matured (r=–0.041) phases, which imply that that older members may be marginally less aligned with evolving group processes, reflecting generational differences in adaptability or openness to new practices. Gorai et al. 2023 and Damor et al. 2024 found similar results. Similarly, family size exhibited negligible effects, with non significant negative correlations in incubation (r= –0.101) and maturity (r= –0.014) stage, indicating larger family sizes may marginally impede group participation, likely due to competing household responsibilities. With regard to experience in dairying, non significant and positive correlation was observed across all stages (r=0.119–0.165), explaining that technical familiarity alone does not guarantee smoother group functioning. The findings are consistent with previous studies of Gorai et al. 2023 and Damor et al. 2024.

Education, in contrast, was positively and significantly correlated with group dynamics in both the growing (r/= 0.298) and matured (r=0.267) stages, implying that higher formal schooling enhances ability of member for collective problem solving and goal alignment, skills that become increasingly critical as FPOs expand and formalize. Damor et al. 2024; Gorai et al. 2023; Garai & Maiti, 2020 also reported similar observations. Similarly experience within the FPOs revealed a significant positive correlation only during the growing stage (r=0.267), indicating that firsthand exposure to organizational processes is most impactful when groups are actively scaling.

Landholding, annual income, economic motivation, risk orientation, extension participation were found significant at one per cent level of probability across the stages of FPO. Landholding correlation with group dynamics, reflected that greater asset ownership, often a proxy for financial stability, fosters deeper commitment and collaboration in FPOs. Whereas Annual income underscored the critical role of economic resources in enabling members to invest time, capital, and effort into group activities. Economic motivation correlation indicated that profit oriented goals can galvanize collective focus and cooperative action. Saikiran et al. 2022 study also reported similar findings. Positive correlation of risk orientation indicated that a willingness to embrace uncertainty may predispose members toward innovative group strategies and shared ventures. Positive correlation extension participation at every stage (r/=0.300–0.590), highlighted the value of technical support and shared knowledge in reinforcing group cohesion. Similarly, herd size was strongly

Table 2: Correlation between independent variables and Group Dynamics of dairy based FPOs

Sl. No	Variables	Incubation (n_1=105)	Growing (n_2=105)	Matured (n_3=105)
1	Age	0.059	-0.113	-0.041
2	Education	0.147	0.298**	0.267**
3	Family size	-0.101	0.070	-0.014
4	Experience in dairying	0.121	0.119	0.165
5	Experience in FPO	0.056	0.267**	0.159
6	Landholding	0.544**	0.627**	0.340**
7	Herd size	0.394**	0.636**	0.199*
8	Milk production	0.192*	0.416**	0.147
9	Annual income	0.595**	0.770**	0.424**
10	Economic motivation	0.485**	0.522**	0.345**
11	Risk orientation	0.455**	0.557**	0.323**
12	Extension participation	0.300**	0.484**	0.590**
13	Training received	0.341**	0.428**	0.190
14	Mass media exposure	0.203*	0.500**	0.239*
15	Social participation	0.247*	0.540**	0.182

* Significant at 5% level, ** Significant at 1% level

linked with group dynamics in incubation (r=0.394) and growing (r =0.636) stages, likely because larger herds signify higher operational capacity. Milk production followed a comparable pattern, correlating significantly in incubation (r=0.192) and growth (r=.416) phases, affirming that productive performance reinforces collective confidence and shared efficacy.

Training received correlated significantly during stages of incubation (r=0.341) and growth (r = 0.428) but not in matured stage (r=0.190), implying that capacity building interventions are most crucial early on. The results are in line with Saikiran et al. 2022; Damor et al. 2024 and Garai and Maiti, 2020. **Mass media exposure** yielded significant positive correlations in incubation (r=0.203) and growth phases (r=0.500) and a moderate, significant at matured stage (r=0.239), endorsing that information flow through mass media can stimulate group awareness and adoption of best practices. **Social participation** outside the FPO likewise supported group dynamics in incubation (r=0.247) and growth stages (r= 0.540), though its impact diminished in matured stage (r =0.182), indicating that broader community networks enhance group functioning especially when organizations are nascent or expanding. The observations made are similar to Saikiran et al. 2022; Damor et al. 2024; Patil, 2021.

Conclusion

The present study demonstrated that while dimensions of group dynamics viz. participation, atmosphere, leadership, trust, and empathy, remain stable across all the stages of the Farmer Producer Organisations of the study and other dimensions evolve markedly with organizational development. During the growing phase, the extent of team spirit was at higher level and group cohesiveness was at lower level, reflecting the dual pressures of scaling and integration, whereas decision making, membership involvement, norms, and task function progressively strengthen, reaching their highest levels in the matured FPOs. Consequently, overall group effectiveness increase steadily, underscoring the role of institutional learning and procedural formalization in collective performance. Correlation analysis revealed that demographic variables, age, family size, dairying experience, exert negligible influence, whereas educational attainment and experience of FPOs strengthen group functioning primarily during growing stage. The significant economic factors viz. landholding, herd size, milk production, annual income, economic motivation, risk orientation and external support such as extension services, training, and mass media engagement exhibit strong and positive association with group dynamics across stages. By enhancing access to essential resources and implementing tailored training programmes, these organizations can achieve greater cohesion, operational efficiency and long-term sustainability. Such interventions not only empower FPO members with the necessary awareness, knowledge and skills but also nurture an environment conducive for collective growth with resilience and sustainable development in the dairy sector.

Acknowledgements

The authors acknowledge the financial support provided by the ICAR–NDRI Karnal through an ICAR SRF Fellowship, which facilitated the present study.

References

Ajith A (2021) Farmer Producer Companies of Kerala: Group Dynamics Assessment of Shareholders. J Exten Education 33(2): 6662-6670

Alagh Y (2007) On producer companies, paper presented at the workshop organized by PRADAN on Linking Small Producers to Markets through Producer Companies on December 20, 2007. New Delhi, p 19

Cartwright D, Zander A (1968) Group Dynamics: Research and Theory, Harper and Row, New York, p 46

Damor CB, Patel MR, Rathod DM (2024) Relationship between the profile of FIGs members and their cohesiveness of ATMA project. Int J Agric Exten Social Dev 7(6): 259–263

Dewangan P; Vinayagam SS, Shrivastava K (2019) Group dynamics effectiveness of women's groups in Raipur district of Chattisgarh. Indian J Ext Edu 55(3): 1-4

Garai S, Maiti S (2020) Group dynamics effectiveness among the women self-help group members of new alluvial zone of West Bengal, India. J Community Mobilization and Sustainable Dev 15(1): 123–129

Gorai SK, Wason M, Padaria RN, Rao DUM, Paul S, Paul RK (2023) Leveraging group dynamics for enhancing the performance of farmer producer organizations in West Bengal. Indian Res J Extens Education 23(3): 1–7

Kujur P, Bharati A, Bhagat U (2019) Farmer producer organization as an opportunity to strengthen small and marginal farmers: A case study in Rajnandgaon district of Chhattisgarh, India. Int J Current Microbiol Appl Sci 8(11): 1832–1838

Kumar A, Mishra AK, Parappurathu S, Jha GK (2018) Farmers' choice of milk-marketing channels in India. Economic & Political Weekly 53(51): 59

Kumar A, Parappurathu S (2014) Economics of dairy farming and marketing: Micro-level perspectives from three major milk-producing states of India. Indian J Animl Sci 84(2): 204–209

Kumar S, Sankhala G, Kar P, Sharma PR (2021) An appraisal of financial sustainability of dairy-based farmer producer companies in India. Indian J Exten Education 57(4): 115-119

Leitch H, Ahuja V, Jabbar M (2014) India's livestock sector: Demand growth, food security, and public investment—Issues and options Prepared for the World Bank, Washington, DC, USA

Lewin, K (1936) A Dynamic Theory of Personality. Mc Graw Hill, New York. p. 30

Manaswi B H, Kumar P, Prakash P, Anbukkani P, Kar A, Jha GK, Rao DUM, Lenin V (2018) Progress and performance of states in promotion of farmer producer organisations in India. Indian J Extension Edu 54(2): 108-113

Mukherjee A, Singh P, Ray M, Satyapriya, Burman RR (2018) Enhancing farmers' income through farmers producers' companies in India: Status and roadmap. Indian J Agril Sci 88(8), 1151–61

Patil Chethan ND, Patel JK, Rahul Bellagi Dundesh (2021) Relationship between characteristics of SHG members and their group dynamics effectiveness index. Guj J Ext Edu 32(2):140-143

Phansalkar S, Paranjape A (2021) Making farmer producer organisations achieve viability: A practical guide. National Association of Farmer Producer Organizations (NAFPO)

Saikiran C, Vyas HU, Dhandhukia RD (2022) Relationship between the characteristics of the women FIG members and their group dynamics effectiveness Guj J Ext Edu 33(1): 26-29

Singha A (2023) An appraisal of group dynamics of Farmer Producer Organizations (FPOs) promoted by Assam Agricultural University in the Lower Brahmaputra Valley Zone of Assam (Master's thesis), Assam Agricultural University, Jorhat

Singh S (2019) Producer company: An innovative and enabling institutional form for producer-owned enterprises In Proceedings of the 47th Dairy Industry Conference (pp 98-99) Patna, India

Thakur D, Sharma K, Sharma M, Suman M (2021) Emerging trend of dairy based producer organizations: Case studies from Himachal Pradesh. Indian J Dairy Sci 74(3): 262–265

Toseland RW, Rivas RF (2009) An introduction to group work practice. Pearson.

Venkattakumar R and Sontakki BS (2012) Producer companies in India-experiences and implications. Indian Res J Ext. Edu 1: 154-160

Wageman R (2001) How leaders foster self-managing team effectiveness: Design choices versus hands-on coaching. Organization Science 12(5): 559-577