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Comparative study about level of adoption of scientific dairy practices by the member and non-member dairy farmers of farmer producer company

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Abstract

The study was conducted during October, 2023 to March, 2024 at Katol and Narkhed. The present study was undertaken with the objectives to study the level of adoption of scientific dairy practices of members and non-members of Farmer Producer Company. The study was carried out in purposively selected Farmer Producer Company i.e. Shri Kamdhenu Dairy Farmer Producer Company (SKDFPC) operating in two blocks i.e. Katol and Narkhed. From each block 120 dairy farmers comprising 60 member and 60 non-member dairy farmers of FPC was randomly selected. Data collection was carried out by using a semi-structured interview schedule. The collected data was analysed by using different statistical tools and the finding revealed that member farmers of the Farmer Producer Companies (FPC) had a significantly higher adoption level compared to non-members, attributed to better access to resources and support. Non-members faced challenges such as limited awareness and financial constraints. The study concluded that FPCs enhance the adoption of scientific practices, improving productivity and sustainability, and highlighted the need for increased institutional support and training to promote scientific dairy farming.

Keywords: Farmer producer company, adoption, market

1. Introduction

Among the 120 million farmers in India, small and marginal farmers make up over 86% of the agricultural workers. They faced obstacles such poor organisation and limited access to loans, markets, and inputs (Shalini *et al.*, 2022)^[5]. Various initiatives, including collective action and contract farming, aim to provide sustainable subsistence for small and marginal farmers in India. The government has established Farmer Producer Companies (FPCs) to enhance access to investments, technology, and markets. As of April 2023, over 15,000 FPCs have been formed, with a target of establishing 10,000 new FPOs by 2024, involving primary producers in agriculture and related sectors through coordinated efforts from different government levels and NABARD. (Singh, 2022)^[6].

Dairy Farmer Producer Companies (FPCs) are collective entities formed by dairy farmers to enhance their bargaining power and share resources. They aim to secure fair prices for milk, improve market access, facilitate collective procurement of inputs, promote knowledge sharing, and advocate for members' interests in policy matters. (Govil,Neti and Rao 2020)^[1]. India has multiple milk producer companies across various states. The Saahaj Milk Producer Company in Uttar Pradesh was established in 2014, comprising 76,540 members and offering cattle feed, mineral mixture, and artificial insemination services. In Rajasthan, the Paayas Milk PC, founded in 2012 and with 74,533 members, provides similar services, including group medical insurance. The Pandhana Pashu Palik PC in Madhya Pradesh, registered in 2016, serves 250 Self-Help Groups (SHGs) and offers a variety of livestock and feed

products. Lastly, the Theni Goat PC in Tamil Nadu, established in 2013, provides input subsidies, loans, and improvements in procurement processes. (Thakur, 2020)^[7]. In Vidarbha region of Maharashtra State, BAIF Institute for Sustainable Livelihoods and Development (BISLD) has started *Shri Kamdhenu Farmer Producer Company* (SKDFPC) with financial assistance from the National Bank for Agriculture and Rural Development (NABARD) in the year 2020 at village *Parsodi* in Katol block of Nagpur District. The SKDFPC is implementing scientific dairy-related practices to develop dairy enterprises among small and marginal farmers. They offer services such as artificial insemination, mineral mixtures, silage making, and animal concentrates. The company also provides management, technical, managerial, and financial advice to its members. They also offer health care facilities, including deworming and vaccinations against diseases. SKDFPC also provides dairy management training to its members, covering breeding management, vaccination importance, clean milk production, and value-added milk products. The adoption of scientific dairy practices is crucial for the development and profitability of dairy enterprises. Farmer Producer Companies (FPCs) empower farmers by facilitating collective bargaining, sharing resources, and providing technical support and training. These interventions are designed to encourage members to adopt modern, scientific methods. Conversely, non-members often rely on traditional methods and face challenges in accessing reliable information on new scientific approaches. This research conducts a comparative analysis of the extent to which FPC members and non-members adopt scientific

practices in their dairy operations.

2. Materials and Methods

The study was conducted during October, 2023 to March, 2024 at Katol and Narkhed. The present study was designed and conducted in the operating area of purposively selected Farmer Producer Company (FPC) working in dairy sector i.e. *Shri Kamdhenu Dairy Farmer Producer Company* (SKDFPC) operating in two blocks i.e., Katol and Narkhed of Nagpur district in Vidarbha region of Maharashtra state. From each block, Katol and Narkhed 120 dairy farmers comprising 60 members and 60 non-member dairy farmers of FPC was randomly selected. The 120 member dairy farmer respondents comprising 60 from Katol and 60 from

Narkhed was selected randomly from the list of the members of FPC collected from the Head Office, SKDFPC Parsodi. An organised interview schedule served as the study's primary tool. The required data was collected through personal interviews with respondents to obtain correct and comprehensive replies and to describe the practices used by member and non-member dairy farmers of SKDFPC in the research region. After collection of data, each case was assigned a number to avoid difficulty at the time of tabulation. The gathered data was recorded in primary table and then presented in a dissertation in the form of secondary tables.

3. Results and Discussion

Table 1: Distribution of respondents according to the adoption of breeding practices (N=240)

Sr. No.	Adoption level	FPC Members (n=120)			FPC Non-members (n=120)		
		Full	Partial	No	Full	Partial	No
I	Breeding practices	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
1	Selection of animal	89 (74.17)	23 (19.16)	8 (6.67)	62 (51.67)	44 (36.66)	14 (11.67)
2	Heat detection by observation of external signs	47 (39.16)	69 (57.5)	4 (3.34)	31 (25.84)	80 (66.67)	9 (7.50)
3	Breeding through artificial insemination	98 (81.66)	19 (15.84)	3 (2.50)	50 (41.67)	53 (44.16)	17 (14.17)
4	Right time of insemination	50 (41.66)	63 (52.5)	7 (5.84)	34 (28.33)	72 (60)	14 (11.67)
5	Pregnancy diagnosis and confirmation by veterinarian	88 (73.33)	24 (20.00)	8 (6.67)	46 (38.34)	56 (46.66)	18 (15.00)
	Overall Average (%)	62.00	33.80	4.20	37.16	50.84	12.00

3.1 Breeding Practices: It was observed from table 1 that 74.17% of member respondents fully adopted animal breeding practices, compared to 51.67% of non-member respondents. Regarding heat detection, 57.50% of member respondents partially adopted the method, while 39.16% fully adopted it; for non-members, 66.67% partially and 7.50% did not adopt. In terms of artificial insemination, 81.66% of members fully adopted it versus 41.67% of non-members, with 14.16% not adopting. A significant 41.66% of member respondents fully adopted the right timing for

insemination compared to 28.33% of non-members. Furthermore, 73.33% of member respondents fully adopted pregnancy diagnosis by a veterinarian, while only 38.34% of non-members did so. Overall, 62.00% of member respondents fully adopted breeding practices, whereas 50.84% of non-members adopted them partially, with 12.00% of non-members not adopting any breeding practices at all. This finding is similar with Maheshwari *et al.* (2015)^[2].

Table 2: Distribution of respondents according to the adoption of feeding practices (N=240)

Sr. No.	Adoption level	FPC Members (n=120)			FPC Non-members (n=120)		
		Full	Partial	No	Full	Partial	No
II	Feeding practices	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
1	Offering green fodder each cow as per requirement	56 (46.67)	64 (53.33)	0 (0.00)	39 (32.50)	60 (50.00)	21 (17.50)
2	Feeding of concentrate to cattle daily as per requirement	92 (76.67)	26 (21.66)	2 (1.67)	58 (48.33)	39 (32.50)	23 (19.17)
3	Feeding of extra allowances of concentrate ration during advance pregnancy/ lactation	79 (65.83)	39 (32.5)	2 (1.66)	60 (50)	53 (44.16)	7 (5.83)
4	Colostrum feeding to new born calf	51 (42.50)	65 (54.16)	4 (3.34)	35 (29.16)	75 (62.50)	10 (8.34)
5	Conservation of fodder by silage making	30 (25.00)	62 (51.67)	28 (23.33)	25 (20.83)	60 (50.00)	28 (23.34)
	Overall Average (%)	51.33	42.67	6.00	36.16	47.83	16.00

3.2 Feeding Practices: It was observed from table 2 that Majority of member respondents (46.67%) fully adopted green fodder feeding practices, compared to 32.50% of non-members. For concentrate feeding, 76.67% of members fully adopted it versus 48.33% of non-members. In terms of additional concentrate feeding during advance pregnancy, 65.83% of members fully adopted this practice compared to 50.00% of non-members. Regarding colostrum feeding to newborn calves, 42.50% of members fully adopted it against

29.16% of non-members, while 25.00% of members fully adopted silage making compared to 20.83% of non-members. Overall, 51.33% of member respondents fully adopted these feeding practices, whereas 47.83% of non-members adopted partially, with 16.00% of non-members not adopting any practices. Ram and Meena (2013)^[4] indicated that 60.00% of co-operative members had high adoption rates of feeding practices.

Table 3: Distribution of respondents according to the adoption of management practices (N=240)

Sr. No.	Adoption level	FPC Members (n=120)			FPC Non-members (n=120)		
		Full	Partial	No	Full	Partial	No
III	Management	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
1	Disinfection of animal shed every week by disinfectant	67 (55.83)	51 (42.5)	2 (1.67)	44 (36.66)	68 (56.67)	8 (6.67)
2	Daily washing and grooming of animals	78 (65.00)	39 (32.50)	3 (2.50)	42 (35.00)	60 (50.00)	18 (15.00)
3	Have you adopted any technology or software for farm management?	35 (29.17)	76 (63.33)	9 (7.50)	23 (19.17)	79 (65.83)	18 (15.00)
4	Disposal of excreta and waste material	61 (50.83)	55 (45.84)	4 (3.33)	41 (34.17)	66 (55.00)	13 (10.83)
5	Drying off the pregnant animal	38 (31.67)	57 (47.50)	25 (20.83)	32 (26.67)	54 (45.00)	34 (28.33)
	Overall Average (%)	46.50	35.83	17.67	30.34	54.50	15.16

3.3 Management: It was reported from table 3 that majority of member respondents (55.83%) fully adopted disinfection practices, while only 1.67% did not; in contrast, 36.66% of non-member respondents fully adopted it. For daily cleaning and grooming, 65.00% of member respondents fully adopted the practice compared to 35.00% of non-members. Adoption of technology for farm management was 29.17% among members versus 19.17% among non-members. Regarding waste material disposal, 50.83% of members

fully adopted this practice, whereas 34.17% of non-members did. For managing pregnant animals, 31.67% of member respondents fully adopted it, contrasted with 26.67% of non-members. Overall, 46.50% of member respondents fully adopted management practices, while 54.50% of non-member respondents adopted them partially, with a notable 15.16% of non-members not adopting any practices. Ram and Meena (2013) ^[4] noted that 56.66% had medium adoption of management practices.

Table 4: Distribution of respondents according to the adoption of health care practices (N=240)

Sr. No.	Adoption level	FPC Members (n=120)			FPC Non-members (n=120)		
		Full	Partial	No	Full	Partial	No
IV	Healthcare	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
1	How frequently do you conduct health checkup for your dairy animals	39 (32.50)	73 (60.83)	8 (6.67)	30 (25.00)	79 (65.83)	11 (9.17)
2	Deworming and Spraying of animals.	53 (44.17)	73 (60.83)	15 (12.50)	39 (32.50)	60 (50.00)	21 (17.50)
3	Support of veterinarian in health care practices of animals	55 (45.83)	58 (48.34)	7 (5.83)	35 (29.17)	70 (58.33)	15 (12.50)
4	Vaccination of animals.	44 (36.66)	69 (57.5)	7 (5.84)	27 (22.5)	80 (66.67)	13 (10.83)
5	Use of medicine for animals	30 (25.00)	66 (55.00)	24 (20.00)	22 (18.33)	68 (56.66)	30 (25.00)
	Overall Average (%)	36.83	56.50	6.67	25.50	59.50	15.00

3.4 Health Care: It was reported from table 4 that 32.50% of member respondents fully adopted frequent health checkups for dairy animals, while 6.67% did not adopt. In contrast, 25.00% of non-member respondents fully adopted this practice, with 9.17% not adopting. For deworming and spraying of cattle, 44.17% of member respondents fully adopted these practices compared to 32.50% of non-members. Support of veterinarians in health care was fully

adopted by 45.83% of members against 29.17% of non-members. For the vaccination of animals, 57.50% of members fully adopted it, whereas only 22.50% of non-members did. Additionally, 25.00% of member respondents fully adopted medicine for animal cures, as opposed to 18.33% of non-members. Overall, member respondents generally showed higher adoption rates for various health practices compared to non-members.

Table 5: Distribution of respondents according to the adoption of record keeping practices (N=240)

Sr. No.	Adoption level	FPC Members (n=120)			FPC Non-members (n=120)		
		Full	Partial	No	Full	Partial	No
V	Record Keeping	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
1	Maintenance of breeding records	52 (43.33)	60 (50.00)	8 (6.67)	36 (30.00)	69 (57.50)	15 (12.50)
2	Maintenance of calving record	50 (41.67)	55 (45.83)	15 (12.50)	34 (28.34)	62 (51.66)	24 (20.00)
3	Maintenance of feeding record	49 (40.84)	62 (51.66)	9 (7.50)	27 (22.50)	51 (42.50)	42 (35.00)
4	Maintenance of health record	34 (28.33)	74 (61.67)	12 (10.00)	21 (17.50)	58 (48.34)	41 (34.16)
5	Calculation of calving date from records	32 (26.66)	66 (55.00)	22 (18.34)	20 (16.66)	74 (61.67)	26 (21.67)
	Overall Average (%)	36.16	52.84	11.00	23.00	52.34	24.66

3.5 Record Keeping: It was reported from table 5 that 50% of member respondents partially adopted breeding record maintenance, with 43.33% fully adopting and 6.67% non-adopting. For calving records, 41.67% of members fully adopted maintenance compared to 28.34% of non-members, while 20% did not adopt. In feeding record maintenance,

40.84% of members fully adopted practices, contrasting with 35% of non-members who did not adopt. Health record maintenance saw 61.67% of members partially adopting, whereas 48.34% of non-members did the same. Only 26.66% of members fully adopted calculation of calving dates, compared to 21.67% of non-members who did not

adopt. Overall, 52.84% of members and 52.34% of non-members partially adopted record-keeping practices, with 36.16% of members fully adopting versus 23% of non-

members; however, 24.66% of non-members did not adopt any record-keeping practices for dairy animals.

Table 6: Distribution of respondents according to the adoption of value addition of milk practices (N=240)

Sr. No.	Adoption level	FPC Members (n=120)			FPC Non-members (n=120)		
		Full	Partial	No	Full	Partial	No
VI	Value addition	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
1	Clean milk production	43 (35.84)	66 (55.00)	11 (9.16)	31 (25.84)	72 (60.00)	17 (14.16)
2	Machine milking	10 (8.33)	62 (51.66)	48 (40)	4 (3.33)	45 (37.50)	71 (59.16)
3	Value addition of milk	39 (32.50)	70 (58.33)	11 (9.17)	26 (21.67)	61 (50.83)	33 (27.50)
4	Chilling facilities for milk products	32 (26.67)	71 (59.16)	17 (14.17)	23 (19.17)	59 (49.16)	38 (31.66)
5	Addition of preservatives	20 (16.67)	74 (61.66)	26 (21.67)	10 (8.34)	56 (46.66)	54 (45.00)
	Overall Average (%)	24.00	57.16	18.84	15.67	48.83	35.50

3.6 Value Addition: It was reported from table 6 that 35.84% of member respondents fully adopted clean milk production practices, compared to 25.84% of non-member respondents. Among members, 40% did not adopt machine milking, while 59.17% of non-members did not adopt it either. For value addition of milk, 32.5% of member respondents fully adopted practices, whereas only 9.17% did not adopt any. In contrast, 27.5% of non-member respondents had not adopted value addition practices. As for chilling facilities, 26.67% of members fully adopted them,

with 14.17% not adopting, while 31.67% of non-members did not adopt chilling facilities. Additionally, 16.67% of member respondents fully adopted the addition of preservatives, compared to 45% for non-members who did not adopt it, with 8.34% fully adopting it. Overall, 57.16% of members and 48.83% of non-members partially adopted value addition practices, with a higher percentage of full adoption among members (24%) versus non-members (15.67%). However, 35.5% of non-member respondents did not adopt value addition practices in dairy animals.

Table 7: Distribution of respondents according to the adoption of marketing practices (N=240)

Sr. No.	Adoption level	FPC Members (n=120)			FPC Non-members (n=120)		
		Full	Partial	No	Full	Partial	No
VII	Marketing practices	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
1.	Marketing channels for milk	33 (27.50)	79 (65.83)	8 (6.67)	23 (19.17)	82 (68.33)	15 (12.50)
2.	Self-marketing of whole milk	26 (21.67)	70 (58.33)	24 (20.00)	28 (23.34)	74 (61.66)	18 (15.00)
3.	Insurance of dairy animals	43 (35.84)	65 (54.16)	12 (10.00)	23 (19.17)	77 (64.16)	20 (16.66)
4.	Branding of the product	15 (12.50)	82 (68.33)	23 (19.17)	0 (0.00)	58 (48.33)	62 (51.67)
5.	Feedback from consumer	39 (32.50)	56 (46.66)	25 (20.84)	18 (15.00)	69 (57.50)	33 (27.50)
	Overall Average (%)	26.00	58.66	15.34	15.36	59.00	25.64

3.7 Marketing Practices: It was reported from table 7 that 27.50% of member respondents and 19.17% of non-member respondents fully adopted marketing channels for milk, with only 6.67% of members not adopting. For self-marketing of whole milk, 23.34% of non-members and 21.67% of members fully adopted, while 15.00% of non-members did not adopt. Regarding insurance for dairy animals, 35.84% of members fully adopted this practice compared to only 19.17% of non-members. Additionally, 12.50% of members fully adopted product branding, while a significant 51.67% of non-members did not adopt this practice. For consumer feedback, 26.00% of members fully adopted it, in contrast to

15.00% of non-members. Overall, 58.66% of member respondents and 59.00% of non-member respondents partially adopted marketing practices, with a higher percentage of member respondents (26.00%) fully adopting practices compared to 15.36% of non-member respondents. However, 25.64% of non-members did not adopt marketing practices for dairy animals.

3.8 Overall Adoption of Scientific Dairy Practices by the Member and Non-member Dairy Farmers of Farmer Producer Company

Table 8: Distribution of respondents according to the overall adoption of scientific dairy practices (N=240)

Variable	Category	FPC Members (n = 120)		FPC Non-members (n = 120)	
		Freq.	Percentage	Freq.	Percentage
Adoption	Low (0-30)	20	16.66	32	26.67
	Medium (31 – 50)	47	39.17	58	48.33
	High (51-70)	53	44.17	30	25.00
Total		120	100	120	100
		Mean 45.26, S.D. 10.56		Mean 39.56, S.D. 9.55	

It was reported from table 8 that majority (44.17%) member respondents had high adoption of scientific dairy practices followed by medium (39.17%) and low (16.66%). It might

be due to they got good practical exposure during training, demonstration and access to experts on best practices in areas like breeding, nutrition and animal health, access to

knowledge encourage members to adopt new, scientific methods. This finding is consistent with study of Maheshwari *et al.* (2015)^[2] and Thapa *et al.* (2019)^[8].

In comparison to non member majority respondents belonged to medium (48.33%) followed by low (26.67%) and high (25.00%) adoption. It might be due to no-member respondent rely on traditional methods or had difficulty in finding reliable information on new scientific approaches. This finding was consistent with study of Singh *et al.* (2010)^[6], Rahman and Gupta (2015)^[3] and Thapa *et al.* (2019)^[8] who found that majority (84.48%) of the member dairy farmers belong to high adoption category of dairy management practices than the non-members.

4. Conclusion

The study conclusively demonstrates that membership in a Farmer Producer Company significantly enhances the adoption of scientific dairy practices. FPC members benefit from practical training, expert demonstrations, and better access to resources, which collectively encourage them to transition from traditional to modern, scientific methods. Non-members, lacking these dedicated support systems, lag behind, showing higher tendencies toward partial or non-adoption of critical practices in breeding, feeding, management, and health care. Overall, FPCs play a pivotal role in modernizing dairy farming at the grassroots level.

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