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RESEARCH ARTICLE

Impact of dairy cooperative membership on milk marketing behaviour in Bihar

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Abstract: The dairy sector in India plays a crucial role in rural livelihoods, contributing over one-fifth to the agricultural output and employing millions of resource-poor households. Despite being one of India's top ten milk-producing states, Bihar still lags behind in terms of per capita milk availability and productivity. This study examined the milk utilization, disposal patterns, and future marketing preferences of Dairy Cooperative Society (DCS) members and non-members in the Banka and Jamui districts of Bihar. Primary data were collected from 120 dairy households using a multistage random sampling technique. The study found that DCS members sold more than 80% of their milk production, whereas non-members sold around 70%. This difference resulted in a significantly higher marketed surplus for members as compared to non-members. The study found that non-members consumed an average of 2.5 litres of milk per day, compared to 1.8 litres among members. Non-members also relied more heavily on informal marketing channels, primarily private dairies and vendors. Cooperative members mainly preferred and marketed milk through cooperatives, while non-members chose private dairies because of their flexibility and quick payments. This study emphasizes the role of cooperatives in promoting commercialization, providing stable prices, and ensuring market access for smallholders. To boost the performance of dairy cooperatives and maximize the socio-economic benefits of dairying in Bihar, milk marketing policies must prioritize awareness generation, capacity-building, and infrastructure development. Such measures would increase the marketable surplus, improve price realization, and strengthen the overall cooperative structure in the state.

Keywords: Dairy cooperatives, Milk marketing, Marketed surplus, Disposal pattern, Cooperative members and non-members

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Introduction

Dairy industry development impacts employment generation by increasing livelihood opportunities for rural people and improving their nutritional standards. India's milk production growth is significantly higher than the global average growth (DAHD, 2024). India has been the largest milk producer globally since 1998, contributing 25% to the global production. Milk production has increased by 63.56% over the past decade, from 146.3 million tonnes during 2014-15 to 239.2 million tonnes during 2023-24, with an annual growth rate of 5.7%, while global milk production is growing at 2% per annum. Additionally, this has increased milk consumption among households. Dairy farming in India plays an important role in the socio-economic growth of farmers. It is practiced along with agricultural operations to create additional income and meet the household needs for milk and milk products. The dairy sector accounts for more than one-fifth of the agricultural value of output and employs approximately 21 million people, the majority of whom are resource-poor (Kumar et al. 2010).

The dairy industry in the country depicts disparities among regions. The eastern region of the country, which includes the states of Assam, Bihar, Chhattisgarh, Eastern Uttar Pradesh, Jharkhand, Odisha, and West Bengal, contributes approximately 12 per cent of the total milk production from a geographical area of around 19 per cent. However, eight states alone, covering around 54 per cent of the geographical area, produce 72 per cent of the milk in the country (Kumari et al. 2022). Overall, dairy development in the eastern region is crucial for two reasons. First, milk production and productivity are very low and have the potential to increase. The milk production potential of the region is dependent on both livestock wealth and the environment. Second, the proportion of poverty and the labour force in the region is relatively higher, and nutritional intake is lower.

Bihar is one of the top ten major milk producing states, and accounts for 5.4 per cent of the national milk production. However, milk availability (277 g/capita) and milk productivity (4.6 kg/day/milking animal) in Bihar are low (DAHD, 2024). Over the past two decades, milk production has increased substantially, from 2.7 million tonnes in 2001–02 to 12.8 million tonnes in 2023–24, resulting in a rise in per capita availability from 88 g to 277 g/day; however, this is still well below the national average of 471 g/day (DAHD&F, 2006; DAHD, 2024). In recent years, modern milk marketing channels, particularly milk cooperatives, have developed significantly across the state. Nevertheless, a considerable proportion of milk continues to be routed through informal channels due to a lack of access to remunerative markets**.** The milk marketing system in Bihar is no different. Due to the lack of efficient marketing systems, small dairy farmers are obliged to sell their produce in informal markets dominated by middlemen, who often pay farmers less than the market price (Singh, 2018). Dairy households generally retain a portion of liquid milk for home consumption, marketing the rest through channels that are most accessible to them.

It has been intensively debated that the country's eastern region holds the potential for a second Green Revolution, which can be achieved by holistic management of land, crops, water, horticultural, biomass, livestock, fishery and human resources (Bhatt et al. 2016). Dairy animals account for the vast majority of livestock in this region. Increasing the production and productivity of dairy animals can improve farmers' livelihoods and nutritional intake. Milk is a highly perishable commodity; therefore, production should be followed by prompt marketing and processing to ensure remunerative prices for farmers. The data on milk utilization and marketing channels used in the region provide policymakers with valuable insights into dairy development initiatives. Also, there is a lack of comparative evidence on milk disposal behaviour between DCS members and non-members in Bihar. In this backdrop, this research was undertaken to study the disposal pattern and marketing preferences of milk among Dairy Cooperative Society members and non-members of DCS households. The objective of the study is estimating the impact of Dairy Cooperative Membership on marketing behaviour of milk in Bihar.

Methodology

The study was conducted in Bihar State, focusing on the Vikramshila Dugdh Utpadak Sahkari Sangh Ltd. (VIMUL) milk union located in Bhagalpur district. VIMUL operates under the Bihar State Milk Co-operative Federation and serves the districts of Bhagalpur, Munger, Banka, and Jamui. A multistage random sampling technique was adopted for selecting the sampled dairy farmers. In the first stage, two districts namely, Banka and Jamui were selected randomly from the operational area of VIMUL. At the next stage, one block from each district was selected randomly and from each block two villages were selected randomly. In the final stage, 30 dairy farming households were selected randomly from each village, comprising 15 members of DCS and 15 non-members. Thus, making a total sample of 120 dairy farm households from two districts. The data was collected with the help of pre-tested and structured interview schedule from June 2023 to January 2024. The information regarding household milk consumption, quantity of milk sold and the marketing agency utilized was collected and subsequently analyzed. The data were analyzed using appropriate statistical tools including frequency, percentage, mean and independent samples t-test using MS-Excel and SPSS software. Independent samples t-test was applied to assess the significance of difference in mean score of variables between members and non-members.

The consumption of milk is one of the important indicators of judging the impact of dairy development on rural communities (Singh and Singh, 1994). The consumption of milk in the study area was either in the form of liquid milk or converted into milk products. For both groups, the marketed surplus of milk was derived by subtracting the quantity retained for domestic consumption from the total quantity of milk produced.

Results and Discussion

Production, consumption and marketed surplus of milk

The average milk production, consumption, and marketed surplus were analyzed in both districts for DCS members and non-members, and the data are presented in Table 1. A significant difference between DCS members and non-members was

Table 1: Production, consumption and marketed surplus of milk

District	Milk production (Litre/day)	Milk consumption (Litre/day)	Marketed surplus (Litre/day)	Milk sold as % to total production
		Banka		
Member	11.43	1.96	9.57	83.38
Non-member	10.54	2.71	7.80	74.29
		Jamui		
Member	8.07	1.57	6.50	80.54
Non-member	8.36	2.23	6.13	73.33

Table 2: Preferred milk channel by members and non-members in future (in percentage)

	DCS Members			
District	Co-operatives only	Co-op+ milk vendors	Co-op+ private dairies	Co-op+ direct selling
Banka	53.33	20.01	13.33	13.33
Jamui	63.33	10.00	16.67	10.00
	Non-members			
District	Private dairies	Direct selling	Milk vendors	Co-operatives
Banka	46.67	16.67	23.33	13.33
Jamui	43.00	20.00	13.33	23.33

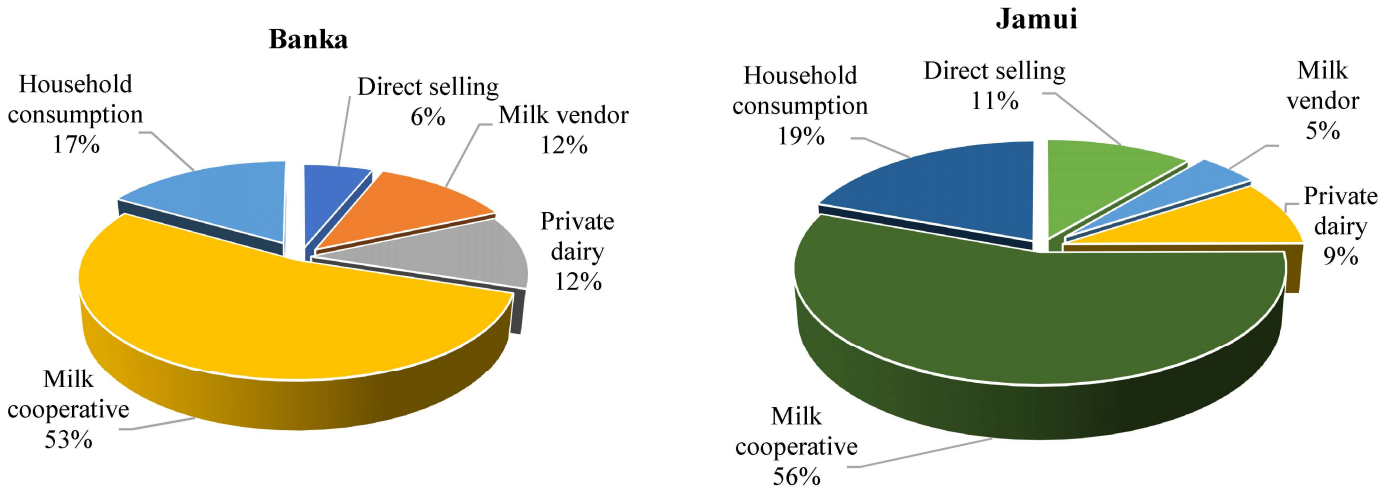


Fig.1 (a) Milk Disposal Pattern of DCS Members in Banka and Jamui

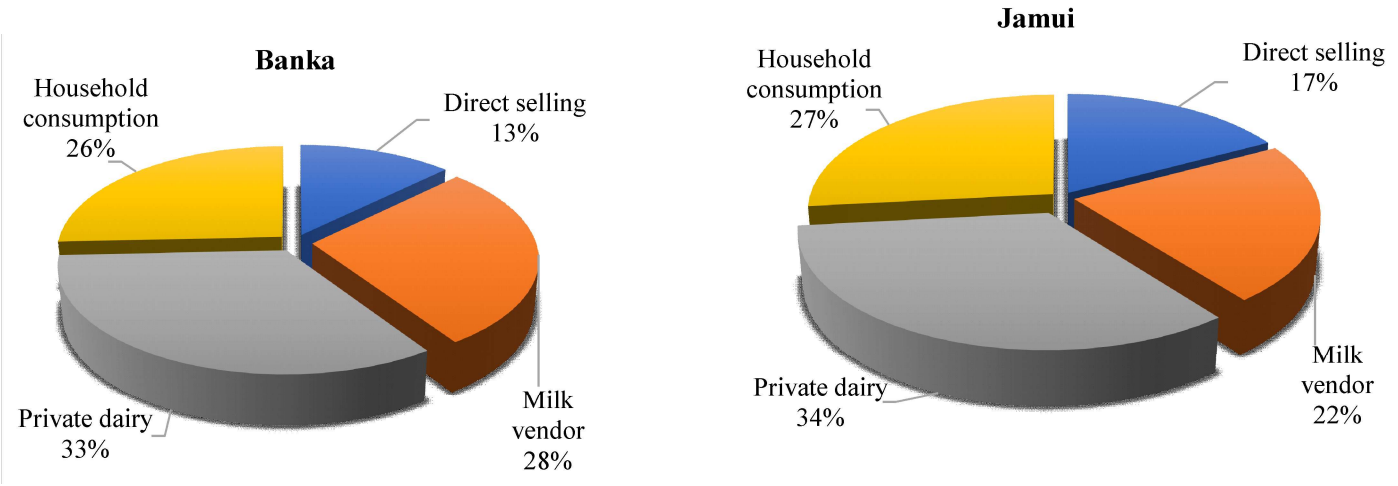


Fig.1 (b) Milk Disposal Pattern of Non-members in Banka and Jamui

observed, highlighting the role of institutional support in dairy farming outcomes (Shah, 2007). A comparative analysis of average daily milk production highlighted a disparity in outcomes between districts. In Banka, DCS members produced more milk on average (11.43 liters) than non-members (10.54 liters). Conversely, in Jamui, the average production for non-members (8.36 liters) marginally exceeded that of members (8.07 liters).

The results revealed a significant difference in household milk consumption between DCS members and non-members across both districts. Milk consumption was found to be higher among

non-members, with 2.71 L/day in Banka and 2.23 L/day in Jamui, as compared to 1.96 L/day and 1.57 L/day among DCS members, respectively. The difference in mean milk consumption between members and non-members was statistically significant at the 5 per cent level. The marketed surplus is the amount of milk actually sold by a household and serves as a key indicator of the level of commercialization in dairy farming. The marketed surplus was significantly higher for the DCS members in both districts. In Banka, DCS members marketed 9.53 liters of milk per day, constituting 83.38% of their total production. This was notably higher than 7.83 liters of milk per day (74.29%) marketed by non-members. A similar result was observed in Jamui, where members marketed 6.50 liters per day (80.54% of production) compared to 6.13 liters per day (73.33%) for non-members. The difference between members and non-members were statistically significant at the 5 per cent level.

Overall, members in both districts marketed approximately 80 per cent of their total milk production, whereas non-members marketed only about 70 per cent. Although, in Jamui, non-members had slightly higher total milk production than members, yet their marketed surplus remained lower.

The overall pattern of milk consumption was uniform across districts for both DCS members and non-members, though non-members consistently consumed a higher quantity. This may be attributed to their lack of assured market access, which encourages greater domestic retention (Chand et al. 2017). Conversely, the significantly higher marketed surplus among members reflects stronger market orientation and more effective integration into formal milk marketing channels. This is facilitated by the cooperative structure, which provides assured procurement, structured pricing, and institutional support, thereby incentivizing members to allocate a greater proportion of production to the market (Kumar et al. 2011).

Milk Disposal Patterns and Preferred milk channel in future

The milk disposal patterns for DCS members and non-members, presented in Figure 1(a) and 1(b), indicates a clear institutional divide between DCS members and non-members. The disposal pattern for DCS members in both districts included five channels: cooperative societies, private dairies, milk vendors, direct sales to consumers, and household consumption. For DCS members, cooperative societies were the dominant channel, comprising 53% of milk disposal in Banka and 56% in Jamui. Other agencies included private dairies (12% in Banka and 9 % in Jamui), milk vendors (12% in Banka and 5 % in Jamui) and direct sales to consumers (11% in Banka and 6% in Jamui). Household consumption accounted for 17 per cent of milk disposal in Banka and 19 per cent in Jamui, reflecting either lower overall production or a cultural preference for home use.

On the other hand, the non-members reflected a contrasting behaviour in milk disposal pattern. Non-members showed a higher inclination toward private dairies and milk vendors in both the districts, signifying a lack of integration into organized channels. In both districts, more than 34 per cent of the milk produced was disposed to the private diaries. In Banka, 28 per cent of the milk was disposed of to milk vendor whereas, in Jamui, only 22 per cent of the milk was disposed. Many non-members opted for direct selling to consumers (13% in Banka and 17% in Jamui).

Dairy farmers' channel selection depends on logistical factors such as the availability of collection centers, concerns about milk spoilage, and the ease of payment (Bharathy, 2020; Mbaya, 2023). The dominance of cooperatives among members underscores the importance of institutional frameworks in providing stable market linkages and organized procurement systems within the state's rural dairy economy. In contrast, many non-members prefer direct sales or informal markets, often valuing the immediate payment, pricing control, and flexibility these channels offer. This choice frequently reflects perceived barriers to cooperative membership, such as administrative delays, membership restrictions, or dissatisfaction with cooperative services, which can make informal channels appear more accessible and responsive when formal systems are seen as inefficient or exclusionary.

The preferred milk channel in future was found to differ significantly between DCS members and non-members in both Banka and Jamui districts. Cooperatives alone were the most preferred marketing channel in the future among the DCS members in both districts (Table 2). The DCS members exclusively opted for cooperatives as the preferred channel, with 63.33 per cent in Jamui and 53.33 per cent in Banka. This indicates a strong trust and reliance on the cooperative structure, possibly due to benefits such as assured procurement, transparent pricing mechanisms and payment reliability (Khan et al. 2014; Kingu and Ndiege, 2018).

Some producers have also diversified their marketing approach by selling to private dairies or directly to consumers along with cooperatives, reflecting efforts to maximize returns or overcome cooperative limitations like collection timing or delayed payments (Wani et al. 2016). The rest of DCS members preferred hybrid channels involving cooperatives along with private dairies, milk vendors and direct selling. In Banka, 20.01 per cent of members preferred both co-operatives and milk vendors followed by co-operatives alongside private dairies and direct selling (13.33% each). While in Jamui, 16.67 per cent preferred co-operatives and private dairies, while 10 per cent each preferred co-operative with milk vendors and direct selling.

This finding was supported by Sharma et al. (2007) and Wani et al. (2016), who reported that members were disposing milk to cooperatives due to assured procurement, stable pricing, and

timely payments, while the rest were disposing milk to other market players besides cooperatives to acquire additional benefits of more price and advance payments. The combination with other channels likely reflects efforts to manage surplus or access better prices, especially during the flush seasons.

Conclusion

The study reveals that dairy cooperative society membership significantly influences the milk production, marketed surplus, and marketing preferences of dairy farmers in Bihar. Members demonstrated a higher marketed surplus and a stronger reliance on formal channels, particularly cooperatives. In contrast, non-members retained a larger share of milk for household consumption and depended more on informal channels due to the flexibility of informal markets. Future marketing preferences reinforced this divide, with members favouring cooperatives and non-members preferring private dairies. The region exhibits significant untapped dairy potential, as demonstrated by the notable levels of milk production and marketed surplus already achieved among the sample households. To harness this, interventions should focus on strengthening cooperative outreach, improving their operational efficiency, and integrating non-members into formal channels. Strategies such as awareness campaigns, training, infrastructure development, and streamlined membership processes could enhance market participation, thereby boosting farmer incomes and improving rural livelihoods across the state. Policies should prioritize creating Women Dairy Cooperative Societies in uncovered areas, as women increase institutional loyalty and production. A targeted and inclusive model will bring dairy farmers into formal markets, improve price stability, and ensure equitable growth in Bihar's dairy sector.

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