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Performance and Economic Impact of Dairy Cooperatives in Pulwama District of Jammu and Kashmir (UT), India

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ABSTRACT

Background: Due to the presence of vast green pastures and moderate climate in J and K (UT), livestock sector has assumed a lot of significance in its Agrarian economy. In this context, the study has explored production and marketing of milk in Pulwama district of J and K. Pulwama district was chosen purposely as it is famously called as 'Anand of Kashmir' and contributes around 24% milk in Kashmir region of J and K.

Methods: Milk production and its disposal pattern by the milk producers in Kashmir was categorized into formal and informal milk marketing channels. Formal channel consisted of production, processing and retailing of milk by small producers through organized channels such as Jammu and Kashmir Milk Producers' Cooperative Limited (JKMPCL). The informal channel comprised of milk processing through traditional vendors and other local intermediaries and or direct retailing of milk to consumers by small milk producers. A comparative analysis of 25 milk producers each in formal and informal milk marketing channels was made to understand demographic profile, costs and returns, major problems and benefits under both the channels.

Result: The findings of the study have revealed that JKMPCL dairy cooperative has created a well-organized formal channel of milk procurement, processing and retailing. Young and educated milk producers' participation was found to be more in formal channel as compared to informal channels. Milk producers in formal channel had more land and larger ownership of dairy animals. Formal channel producers received larger returns due to higher milk yield and prices than the informal channel producers though the cost of milk production was found to be higher in formal channel. The study suggested that enhancing milk procurement and processing through formal channels such as cooperatives and extending advance credit and training facilities and veterinary services through cooperatives can a play a vital role in improving farmers' welfare in Kashmir region of India.

Key words: Dairy cooperatives, Formal milk markets, JKMPCL, Milk procurement.

INTRODUCTION

The economy of Jammu and Kashmir (J and K) continues to be largely agrarian with around 70% of its population directly or indirectly engaged in agricultural and allied activities for their livelihood generation. The contribution of agricultural sector in Gross Domestic Product of J and K stands at 16.91%. The cropping pattern of JandK is diverse with rice, wheat and maize as major food grain crops, while fruits and vegetables are also grown over 11.5% of the cropped area. Farmers in J and K are categorized as marginal farmers due to very small agricultural landholdings of about 0.59 hectares (Anonymous, 2022-23). Given the availability of vast geographical area and green pastures coupled with moderate climate, livestock sector in J and K plays a vital role in its agrarian economy. J and K contributes about 1.5% to the total livestock in India (Anonymous, 2019a). Average number of livestock available per household in J and K is found to be six, compared to three across India (Anonymous, 2019b). JandK has witnessed a steady increase in milk production from 1360 thousand tonnes in 2001-02 to 1609 thousand tonnes in 2010-11 and 2727 thousand tonnes in 2021-22 (Anonymous, 2021). The per capita availability of milk in J and K is 557 grams per day as against 444 grams per day at all India level (Anonymous, 2023). However, despite the enough potential for production of milk, marketing system in J and K is traditional, exploitative and archaic, with the organised sector accounting for only 1.7% and 5% of total liquid milk output and marketable surplus, respectively. Due to lack of a regular milk outlet, milk marketing system in J and K is unorganized. Milk producers are excessively dependent on intermediaries and milk vendors/shops, who exploit them by not paying reasonable prices and leaving them with little incentive to raise their milk production. This supply chain also harasses urban customers by procuring low quality and adulterated milk at excessive costs (Wani and Wani, 2010; Sinha and Mishra, 2023; NABARD, 2022-23).

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To overcome problems in traditional vendor-driven milk marketing system, cooperative system was set up in JandK with the establishment of Jammu and Kashmir Milk Producers' Cooperative Limited (JKMPCL) in 2004 to provide milk producer members with a consistent income throughout the year by procuring milk at the village level, eliminating middlemen from the supply chain and giving milk producer members the appropriate technical input and assist for their overall socio-economic upliftment. It is argued that dairy cooperatives play an important role in generating rural livelihoods in terms of income and employment opportunities (Kaur and Singla, 2024; Singla, 2021; Kaur and Toor, 2024). Dairy cooperatives are also found to be resilient in the COVID-19 period in India (Das *et al*., 2024; Verma *et al*., 2023). Several studies have examined role of dairy cooperatives in J and K. One such study by Hamadani *et al.* (2023) examined only the socio-economic status of dairy farmers in Srinagar district of J and K. According to Wani and Wani (2010), the cooperative society-a crucial market player in the milk trade of J and K-was either non-existent or handled relatively little milk in terms of volume. Similarly, Wani *et al.* (2016) reported that 75% of the respondents never participated in co-operative societies as they perceived them as only collection centres. It was also reported by Wani *et al*. (2015) that the cooperatives paid milk procurement prices less as compared to that paid by private agencies and local vendors. Poor performance of dairy cooperatives in Kashmir was due to low membership and hence, low milk procurement (Rather *et al*., 2016a). However, we do not come across any such study which has comprehensively examined procurement system of JKMPCL and compared milk producers' participation in cooperative (formal channel) and traditional and unorganized markets (informal channels) in terms of socio-economic profile of milk producers, labour use on their farms, costs and returns from milk production, *etc*. Therefore, the study was conducted to understand performance of JKMPCL and its economic impact on milk producers in Pulwama district of J and K, UT.

MATERIALS AND METHODS

The present study was conducted in Pulwama district of J and K in 2021-22 at Central University of Punjab, Bathinda (Punjab). Pulwama district is a leading milk producing district with a production of 284 thousand metric tonnes thereby, earning the name 'Anand of Kashmir' (Lone *et al*., 2022). It contributes around 12% and 24.4% of total milk production of J and K and Kashmir regions, respectively (Rather *et al*., 2016b). The network of cooperatives is the largest in Pulwama. In addition, the district also has many private dairy plants, *viz*., Khyber Agro Farms Pvt Ltd., M/s Zum Zum Milk Products, M/s Insha Dairy Ltd. and M/s Haleeb Milk Products. As a result, the district was considered as the best case to do a comparative study on production and marketing of milk in JandK under formal and informal milk marketing channels. Formal channel consists of production, procurement, processing and retailing of milk through JKMPCL, while informal channel comprises of milk processing through traditional vendors and local intermediaries and or direct retailing of milk to consumers by small milk producers. The data for the present study was collected through a primary survey concerning the socio-economic characteristics of the households, their assets (land/livestock) and accessibility to the market, road and other facilities. The respondents were personally interviewed with the help of a pre-tested structured interview schedule. From the formal channel, 25 milk producers supplying milk to JKMPCL were selected and interviewed. From the informal channel, another 25 milk producers were identified and interviewed who sold milk to intermediaries or directly to consumers (Table 1). A comparative analysis of formal and informal channels was made using simple statistical techniques. A separate schedule was also designed to study functioning and organization of JKMPCL. Besides, annual reports of JKMPCL were also accessed to examine its performance in terms of membership base, milk procurement and processing.

RESULTS AND DISCUSSION

Jammu and Kashmir milk producers' cooperative Ltd. (JKMPCL)

JKMPCL came into existence in 2004 as a result of agreement signed by J and K Government with Gujarat Cooperative Milk Marketing Federation (GCMMF). It was founded with the goal of developing the dairy industry as a whole and addressing the milk scarcity while emphasizing the empowerment of marginalized and women farmers. Presently, it has two plants, one at Cheshmashahi Srinagar and the other at Satwari Jammu. JKMPCL is a farmer-centric cooperative organisation working as per J and K Self Reliant Cooperative Act, 1999 with prime motive of eradication of middlemen in the procurement of milk so as to reach out to each and every milk producing farmer with remunerative price for their produce throughout the year. Provision of technical inputs to the milk producers is also an underlying concern of the entity. JKMPCL is managed and controlled by Board of Directors, which is constituted

Table 1: Number of respondents in formal and informal channel.

District	Milk producers		Total
	Formal channel (JKMPCL)	Informal channel (Traditional intermediaries or directly to consumers)	
Pulwama	25	25	50

for three years. Out of 12 board members, four members each from JandK elected from registered Dairy Cooperative Societies, three are representatives from GCMMF and CEO by virtue of post is member/secretary to the board. 'Well educated board members and good commitment to ensure orderly growth of the dairy industry and cooperatives' has been considered among strengths of this organisation (Wani *et al*., 2014). There are two plant managers responsible for handling the two processing plants at Srinagar and Jammu. JKMPCL is the apex implementation agency of various centrally sponsored schemes *e.g*. Clean Milk Project (CMP), National Programme for Dairy Development (NPDD) and Integrated Dairy Development Programme (IDDP) in the UT of J and K, for which grants in aid are given by various agencies of the Government of India. JKMPCL undertakes responsibility for supplying balanced cattle feed of BIS Type-II standard on 'no-profit, no-loss basis' as input services to member societies/milk producers under the brand name of 'Amul Nutri Gold' or 'Amul Power Dan' and other types of quality cattle feed. It also provides training to its AMC Operators at GDDC Gujarat for onward training and sensitization of their milk supplying farmers in order to adopt best practices of rearing in-milk animals and improving productivity.

JKMPCL is a dairy cooperative with a network of 57,308 milk producers across the UT and procures about 427 lakh kg of milk. It has about 602 village-level dairy cooperative societies, which are covered through 37 milk routes in Kashmir region. In Jammu region, it has 539 operational dairy cooperative societies, which are covered through 25 milk routes. JKMPCL has a chilling capacity of 1.25 lakh litres per day in Jammu division and 1.0 lakh litres per day in Kashmir valley. Procurement of milk takes place at the village level through Dairy Cooperative Societies, which are supported by Women Self Help Groups working under the ambit of J and K Self Reliant Cooperative Act, 1999 and the JandK State Rural Livelihood Mission (JKSRLM) respectively. Each such dairy cooperative society in the village has a milk collection centre equipped with Automatic Milk Collection System (AMC) which are installed by the JKMPCL through the funding support of JKSRLM (Fig 1). At AMC level, the operator tests the milk of each milk producer on two broad criteria, compositional (Fat content and SNF content) and volume parameter, based on which farmer-wise payment receipt is generated. Price list based on Fat and SNF content is pre-installed in the system by the JKMPCL as per the procurement price notified from time to time for the entire UT. Sale proceeds are directly credited into the accounts of milk producers at an interval of 10 days. Milk collected is poured in big aluminium cans for transportation to bulk milk coolers (BMCs) and then to processing plants through insulated milk tankers arranged by the JKMPCL. After pooling milk collections in a particular village, the whole consignments are carried to the nearby catchment area for its deposition in bulk chilling centre. In this way, BMCs chill raw milk at below 4°C to prevent spoilage from rise in temperature in transit from milk cooperative societies to the JKMPCL. The system has led to transparency and fair trade practices. The presence of middlemen, barter system and traditional methods of milk processing are unremunerative leading growers to disinterest in increasing productivity and improving quality of milk. Since its inception, JKMPCL continuously assesses costs, demand and supply and increased rates up to Rs 36-39 per litre of milk during the year 2021-22. JKMPCL has enabled itself to provide assured market for milk producers as payment is credited on a 10-day cycle basis directly into the bank account jointly operated by two signatories-chairman and the secretary of the society.

JKMPCL has been diversifying its product range to meet the growing demand of their customers. New additions of products include: toned milk, double toned milk, full cream milk, dahi, shudh ghee, flavored milk under its brand 'Snowcap'. For better disposal of locally procured

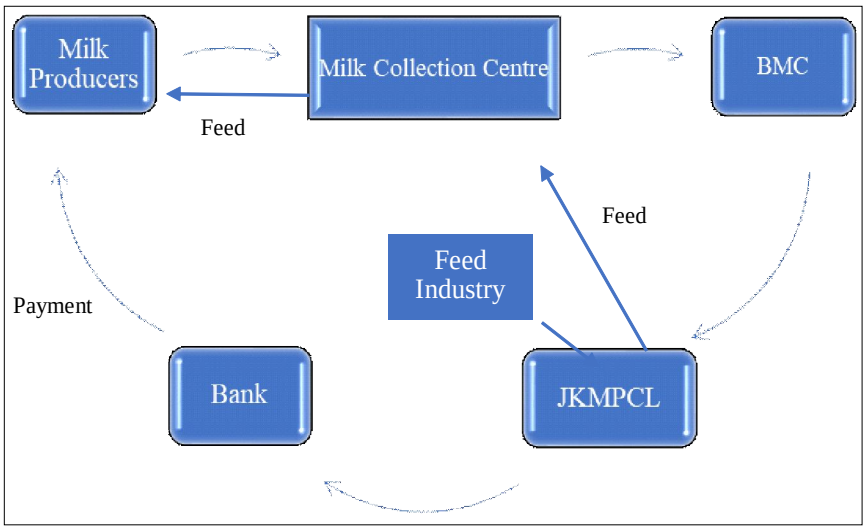


Fig 1: Flow diagram of the JKMPCL milk procurement system.

milk in Kashmir, the society started packing of pouch milk under the branch name of 'Amul' at its Srinagar plant, which the customers consider a welcome step. With the help of the Department of Animal Husbandry and Dairying (DAHD), the JKMPCL is proposing to install more Automatic Milk Collection (AMT) systems, Bulk Milk Coolers (BMC) and expand processing capacities of their existing milk plant. New facilities of paneer manufacturing have been installed at both plants of Jammu and Srinagar. A new plant of ice cream manufacturing is being installed at their Jammu plant. Processing capacity of the Jammu plant has been increased from 50 KLPD to 100 KLPD.

JKMPCL procures more than one lakh litres of milk every day from producers for which around Rs 380 lakh is paid as upfront price of milk following 10-day payment cycle. JKMPCL pays highest procurement price to the societies plus annual bonus depending upon the profitability of the society. Regular milk payment system and regular payment of bonus to the producers is counted amongst greatest strengths of the JKMPCL (Wani *et al*., 2014). During the months from June to August, due to abundant foliage and green grass in the farms of the valley, the productivity of milk tends to increase. During this period, milk producers argue that JKMPCL reduces procurement prices of milk drastically for the same fat/SNF, which it procures at higher prices during other months of the year. Milk producers opined that dairy cooperative societies need to maintain milk prices and use surplus milk to alternate uses for which there is sufficient demand in the market. 'Low price of milk as compared to other private competitors together with high cost of milk production *vis-à-vis* low productivity' are identified as weak areas of the JKMPCL (Wani *et al*., 2014).

Milk producer's participation in formal (JKMPCL) and informal channels

This section of the study has made a comparative analysis on milk producer's participation in formal and informal milk marketing channels. Table 2 reveals that average age of the milk producers in formal channel was 39 years, while it was 49.6 years among informal channel supplying producers. In formal channel, 48% producers were in the age group of 31-40, while it was only 20% in case of informal channel producers. Further, 28% of the producers in the informal sector were in the age group of 50-60 years. This shows that young milk producers were found to be associated in the formal channel for marketing of the milk. On the other hand, older generation still continued to be involved in the unconventional or the informal channels for selling milk. The possible reason could be that young generation was more interested in modern way of doing business and cooperative networks work in a very modern way in milk procurement and processing. The older producers felt much safe with unconventional channels as these were socially more familiar and closer to their household. Around 20% of the producers were in the age group of 41 to 50 years. A very low 4% of producers in the formal channel were in the age group of 60 years and above. 16% of the milk producers were found to be in the age group of 21 to 30 years. Only 8% of milk producers who sold to informal channels were in the age group of 21 to 30 years. The informal channel had a blend of almost all age groups (Table 2).

Distribution of formal and informal channel milk producers by their education level is given in Table 3. 36% of milk producers in the formal channel were educated between the tenth and twelfth grades, followed by post-graduates (24%) and graduates (20%). In sharp contrast, 64% of the milk producers in the informal channel were under matriculates as compared to that only 20% in formal channel. Only 4% of the milk producers in the informal channel were post-graduates. It can clearly be observed that more educated producers were likely to join the formal marketing channels for milk disposal rather than informal channels. It was largely due to the presence of transparent working system in cooperative societies. On the other hand, the producers who were linked and sold through informal channels were low in education. Such producers did not trust the modern way of working in societies, where most of the procurement related operations were done digitally. There were also other factors such as advance payments under informal milk markets and distant location of milk collection centres of cooperative, which caused them to dispose of milk through informal channels.

Table 4 shows the ownership of land and cows among the formal and informal milk producers. Average land size of members supplying milk to formal channels was more than that of informal channel producers. Average land size

Table 2: Distribution of formal and informal milk producers by their age.

Age (in years)	Formal	Informal
21-30	4 (16)	2 (8)
31-40	12 (48)	5 (20)
41-50	5 (20)	6 (24)
51-60	3 (12)	7 (28)
60-above	1 (4)	5 (20)
Average age	39	49.6

Note: Figures in parentheses are percentage of total in each channel.

Table 3: Distribution of formal and informal milk producers by their education.

Education	Formal	Informal
Below 10^{th}	5 (20)	16 (64)
10^{th}-12^{th}	9 (36)	4 (16)
Graduate	5 (20)	4 (16)
Post-Graduate	6 (24)	1 (4)

Note: Figures in parentheses are percentage of total in each channel.

of milk producers in formal channel was worked out to be 5.56 kanals as compared to 5.08 kanals in informal channel producers. Average number of cows were also found to be more among formal channel producers (8.5) than that among informal channel producers (2.2). Further, milk producers in formal channel used dairy as a source of primary income. Most of the milk producers who sold their milk to JKMPCL were dependent on the income that they received from the cooperative, as this was their main source of income. It was also noted that those milk producers who sold milk to informal channels had dairying as a secondary source of income. They were mainly involved in non-farm activities as their land was also less. They were in dairying as it supports them by giving additional income, which was beneficial for repayment of loans.

Table 5 shows the distribution of milk producers in formal and informal channels by use of labour in dairying. Dairying can involve both labour- and capital-intensive work depending upon its degree of commercialization. It was observed that in formal channel, 40% of the milk producers used only hired labour for dairying, while both family and hired labour were used by 36% of the milk producers. Only 24% of the milk producers used family labour for their dairy business. However, in the informal channel, 76% of the milk producers used only family labour. None of the milk producer in informal channel was found to use only hired labour. Only 24% of the milk producers were found to use both family and hired labour. The usage of hired labour was more in formal channel as milk producers had more number of cows and as a result, their farms were much more commercialized and market-driven as compared to the informal channel producers. Consequently, milk disposal pattern also differed significantly in formal and informal marketing channels. Average price realized per litre of milk was higher in formal channel (` 34) as compared to the informal channel (` 29.7). Milk retained at home was more among informal channel producers (4.25 litre per day) as compared to that among formal channel members (3.12 litres per day). There was a lot of difference between the average milk sold between the formal and informal channel producers. Average milk sold was found to be much higher in formal channel (122.56 litre per day) as compared to that sold in informal channel (24.72 litre per day) (Table 5).

Costs and returns of the milk producers under formal and informal milk marketing channels are presented in Table 6. Since, the farms of formal channel milk producers were commercialized and market driven, use of dairy inputs was found to be better organized among milk producers in formal channel. Quality of feed and nutrients fed to animals were also of good quality. As a result, the milk producers incurred more expenditure on producing milk for cooperatives. Expenditure was also higher due to the fact that milk producers under formal channel were paid prices based on milk fat and SNF in the milk. Milk yield was also higher in the formal channel than in the informal channel and the milk producers received higher prices for quality milk under cooperatives as compared to the prices in informal milk marketing channels. Thus, milk producers under formal milk channels received larger returns on per animal and per farm basis due to higher milk yield and prices than the informal channel producers.

The problems faced by milk producers in the production and marketing of milk in formal and informal milk marketing channels are given in Table 7. High input costs of feed, concentrate and other items for producing milk was a major problem for 60% of milk producers in formal channel. Moreover, 40% of formal channel milk producers also argued that they did not get the fair and remunerative price for the milk that they had produced. This problem was much more compounded in case of informal channel producers as 56% of them pointed out the lack of fair price in the informal markets. 44% of informal channel producers also opined that high input costs deterred them to produce good quality milk. It was pointed that most of the animal feed and concentrate came from adjoining Punjab state. Lack of local industries had led to higher prices for dairy inputs. 52% of the milk producers in formal channel and 20% in informal channel also revealed

Table 4: Ownership of land and cows among formal and informal milk producers.

Ownership of land and cows	Formal	Informal
Average land size (kanal)	5.56	5.08
Average no. of cows	8.56	2.2

Table 5: Labour usage and milk disposal pattern among milk producers in formal and informal channels.

Labour usage	Formal	Informal
	Labour usage	
Only family labour used	6 (24)	19 (76)
Only hired labour used	10 (40)	-
Both (family + hired)	9 (36)	6 (24)
	Milk disposal pattern	
Average milk price per farm (Rs./litre)	34	29.76
Average milk retained at home (litre per day)	3.12	4.25
Average milk sold (litre per day)	122.56	24.72

Note: Figures in parentheses are percentage of total in each channel.

Table 6: Costs and returns from milk production under formal and informal channels.

Costs and returns	Formal (per day)		Informal (per day)	
(in Rs.)	Per animal	Per farm	Per animal	Per farm
Green fodder	55.3	475	32.5	74.6
Concentrate	111.0	962.8	55.5	139.4
Dry fodder	25.1	211.9	28.2	59.0
Veterinary charges	13.0	116	5.8	11.8
Labour cost	17.7	186.9	7	19.4
Electricity	2.8	20.9	4.6	8.8
Transport	2.6	20.7	4.7	8.8
Miscellaneous charges	3.8	24.3	8.5	14.2
Total cost	231.4	2018.9	146.9	336.5
Cow dung	19.1	165.7	16.5	35
Net cost	212.2	1853.2	130.4	301.5
Price per litre	34.44	34.4	29.7	29.76
Yield (in litre)	14.8	122.56	10.5	24.72
Gross returns	512.2	4220.9	315.3	735.6
Net returns	300.0	2367.7	184.9	434.1
Cost/per litre of milk	14.2	15.1	10.5	10.5
Net returns/litre of milk	20.1	19.3	19.1	19.1
Dairy gross receipts	300.0	2367.7	184.9	434.1
Input-output ratio	2.2	2.0	2.1	2.1

Table 7: Distribution of formal and informal channel milk producers by problems faced in production and marketing of milk.

Problems	Formal	Informal
Production		
High input cost	15 (60)	11 (44)
Not getting fair and remunerative prices	10 (40)	14 (56)
Marketing		
Competition from outside state	12 (48)	5 (20)
Middlemen cartels	13 (52)	5 (20)
No problem	-	15 (60)

Note: Figures in parentheses are percentage of total in each channel.

Table 8: Access to markets and roads (in kms.)

Distance to	Formal	Informal
Milk collection centre	1.2	2.6
Metalled road	1.3	1.4
Main market	3.1	3.8

that cartels created by the middlemen acted as major hindrance in marketing of milk. Thus, local middlemen and traditional retailers created the problems for formal channel milk producers for linking with the formal channel. Further, 52% of milk producers in formal and 20% in informal channel argued that entry of milk from outside states like Punjab, Haryana and Gujarat had given tough competition to them. It was argued that their milk prices were so competitive that it became difficult for local dairy farmers to compete with them.

Availability of the milk route for milk producers acted as a deciding factor while choosing a marketing channel. If the distance of milk collection centre was more than one kilometre, there were chances of choosing informal channels by the dairy farmers (Rather *et al*., 2016b). Access to milk markets and roads among formal and informal channel milk producers is given in Table 8. It was observed that the distance from dairy farm to milk collection centre was more for the producers who sold milk in informal channels. In other words, it was found that milk collection centres of dairy cooperative were located near to dairy farms of milk producers. The distance of the metalled road for the formal and informal channel producers was similar. Average distance to the nearby main market was more for informal channel producers as compared to formal channel.

CONCLUSION

Milk producers' participation in dairy cooperatives has been identified as one of the several pathways to improve their livelihoods. In this context, a comparison of milk producers supplying milk to Jammu and Kashmir Milk Producer's Cooperative Society (JKMPCL) in Pulwama district of J&K (UT) with the informal channel supplying milk producers had revealed that the milk producers associated with dairy cooperative were relatively young, better educated and had more land and livestock assets as compared to informal channel producers. Milk producers in formal channel received larger returns on per animal and per farm basis due to higher milk yield and prices than the informal channel

producers though the cost of milk production was higher in formal channel. Milk producers in both the channels faced the problem of high input costs and lack of remunerative prices for the milk. Since the Kashmir region also witnessed the arrival of milk from adjoining states, there existed a demand for milk. However, the middlemen cartels created major hurdles for milk producers. Pulwama is the highest milk-producing district of the J&K (UT) but only 30% of villages are covered by dairy cooperative societies (Rather *et al.,* 2016a). Therefore, dairy cooperatives need to enhance milk procurement and processing facilities by expanding their operations in far flung areas. There is also need to extend credit, veterinary and training facilities at the door steps of the milk producers by dairy cooperatives to build strong and sustainable linkages with the milk producers. Government can play its role by removing market cartels, regulating prices of technical dairy inputs, improving the animal breeding facilities and rural infrastructure to improve livelihoods of milk producers in J&K (UT) in the presence of dairy cooperatives.

Conflict of interest

All authors declared that there is no conflict of interest.

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