

Original Research Article

Management of procurement of milk and marketing of milk and milk products by Vijayapura and Bagalkot Milk Union Limited (VIMUL), Karnataka.

ABSTRACT:

Livestock, particularly milch animals, significantly contribute to the livelihoods of many families in India, particularly among resource-poor farmers. This study focuses on the business performance of Vijayapura and Bagalkot Milk Union Limited (VIMUL) in Karnataka, India. The analysis spans from 1986-87 to 2021-22, examining growth in milk procurement, marketing management, and sales performance. Both primary and secondary data were utilized, including compound growth rate analysis and tabular presentations. The findings reveal a positive trend in the growth of dairy co-operative societies (DCSs), milk procurement, and sales, with notable fluctuations influenced by factors like government schemes, weather conditions, and market dynamics. VIMUL's efforts have led to increased milk procurement and member participation, particularly during certain periods. However, challenges such as defunct DCSs and fluctuating procurement rates persist. The study underscores the importance of revitalizing defunct DCSs, enhancing farmer motivation, and ensuring timely support services to sustain growth. Furthermore, the classification of DCSs based on milk procurement highlights the need for targeted interventions to improve procurement from smaller societies. The analysis of product mix and sales performance emphasizes the significance of understanding consumer preferences and market dynamics for effective diversification and marketing strategies. This study provides valuable insights into the business performance of VIMUL, suggesting strategies for enhancing milk procurement, marketing efficiency, and product diversification. Addressing challenges and leveraging opportunities identified in this study can contribute to the sustainable growth of dairy co-operatives in India.

Keywords: Livestock, Milk procurement, Dairy co-operative societies, Marketing management, Sales performance, Product diversification.

INTRODUCTION

Livestock is a source of subsidiary income for many families in India, especially the resource-poor farmers who maintain few animals. Milch animals, including cows and buffaloes, provide regular income to the livestock farmers through the sale of milk. A large number of people in India being less literate and unskilled depend upon agriculture for their livelihoods. The landless and fewer land people depend upon livestock for utilizing their labour during the lean agricultural season. The country has one of the largest stock of buffaloes and cows and contributes to 24.64 per cent of global milk production, and has an annual growth rate of 4.5 per cent. The country had achieved annual milk production of 221.10 million tonnes during 2020-21 with per capita availability of 459 grams per day (Department of Animal Husbandry, Dairying & Fisheries, GOI, 2023) which is greater than the average milk availability in the world viz., 294 grams per day.

Indian states have state federations, and several co-operative dairy milk unions, private dairy plants, primary milk co-operative societies which play an important role in the production of milk in the state. In India, there are 22 state federations with 170 district-level unions, more than 76,000 village-level co-operative societies, and 11 million milk producer members. These co-operatives collect an average of 15 million litres of milk each day. Karnataka, with a milk production of 5.5 metric tonnes is the 11th largest milk-producing state, constituting about 5 per cent of the country's total milk production. Further, Karnataka ranks 2nd in India in the procurement of milk by the Milk Producers' Co-operative Societies (MPCSs). MPCSs functions at the village level, which acts as a catalyst between farmers and co-operative milk unions. Functions throughout the year in two shifts and helps the farmers to produce more milk. In Karnataka, about 1.33 crore households seeking employment, out of which approximately 60 per cent of households got the employment directly and indirectly (Census, 2011). Milk co-operatives play a significant role in providing supplement income and employment to these households.

The Karnataka districts of Vijayapura and Bagalkot are home to the Vijayapura and

Bagalkot Milk Union Limited (VIMUL). Vijayapura and Bagalkot Milk Union is sixth in milk procurement among the State's 14 milk unions. The districts of Vijayapura and Bagalkot are part of its milk-shed region. In 1986, the Karnataka government built the Vijayapura and Bagalkot union, which has a 60 TLPD capacity (Thousand litres Per Day). It became a part of the region in which the operation flood was carried out after joining the KMF in 1986. As a part of this programme, a chilling centre with a 1-LLPD (Lakh Litres Per Day) capacity and a farm cooler with a 60-TLPD capacity were also created in 1995.

Over 455 DCSs (Dairy Co-operative Societies), 331 of which are operational, provide milk to the union in 2021-22. These functional DCSs have been steadily increased during the past few years, from the 11,456 members in 1986 to the 76,699 members in 2021. The union's efforts in the area of procurement have allowed it to obtain an average of 1,74,029 litres of milk per day in 2021. The performance of any society may or may not meet the standards set by the business performance criteria, nevertheless. Therefore, the present study is an attempt to document the business performance of Vijayapura and Bagalkot Milk Union in Karnataka state.

SPECIFIC OBJECTIVES

- 1) To study the growth in procurement of milk by Vijayapura and Bagalkot milk union.
- 2) To study the marketing management of milk and its products.

METHODOLOGY

For the analysis of the objectives of the study, both primary and secondary data are utilized. The primary data have been collected from the sample respondents through the help of retailers and from the administration officials with the help of pre-tested questionnaire. The secondary data on several aspects of the activities (balance sheet, procurement etc) of the KMF selected data were collected from different sources since its inception depending on the availability of the required information for the study.

GROWTH RATE ANALYSIS

For computing the growth in area, quantity of milk procured and amount of milk and milk products marketed in Vijayapura and Bagalkot district of Karnataka state, the compound growth rate analysis was carried out. The compound growth function was specified in the following form.

$$Y_t = AB^t U_t \dots\dots\dots(1)$$

Where,

Y_t = Area/production/productivity in the year t

A = Intercept indicating Y in the base Period ($t=0$)

$B = 1 + g$

t_i = Time Period ($i = 1$ to 9)

U_t = Error term

g = Average annual compound growth rate

Equation (1) was converted into the logarithmic form in order to facilitate the use of linear regression. Taking logarithms on both sides,

$$\ln Y_t = \ln A + t (\ln B) + \ln U_t \dots\dots\dots(2)$$

or

$$Q_t = a + bt + ut$$

Where,

$Q_t = \ln Y_t$

$a = \ln A$

$b = \ln B$

t = Time

$U_t = \ln U_t$

The district wise and area wise linear regression of the above form was specified separately for area, procurement and marketing of selected Dairy Co-operative Societies. The values of 'a' and 'b' were estimated by using Ordinary Least Square estimation technique. Later, the original 'A' and 'B' parameters in equation (1) were obtained by taking anti-logarithms

of 'a' and 'b' values as;

$A = \text{Anti Ln } a$

$B = \text{Anti Ln } b$

Average annual compound growth rate was calculated as;

$B = 1 + g$

$g = B - 1$

TABULAR ANALYSIS

The data collected was presented in tabular form to facilitate easy comparisons. The classification of DCS, milk procurement performance, products of VIMUL were studied using tabular analysis. The data was summarized with the help of statistical tools like averages and percentages to obtain meaningful inferences of the results.

RESULTS AND DISCUSSION

PROGRESS OF VIMUL SINCE ITS INCEPTION

The Table 1 show that the progress of the milk union in terms of the total number of DCSs functioning, procurement, sales, and total number of members supplying milk showed an increasing trend. The results indicated that the average number of DCSs registered in Period I (1986-87 to 1995-96) were 237, which increased to 435 in Period IV (2016-17 to 2021-22) and the highest growth rate was observed in Period I, *i.e.*, 6.05 per cent over ten years due to

vigorous activities taken by union to register new DCSs in various places. The lowest growth rate was observed in Period IV (0.43%) due to COVID-19 pandemic condition which made activities difficult to carry out. And the average functioning DCS were 90 in Period I, which increased to 328 in Period IV, and the highest growth rate was observed in Period III (8.31%) and the lowest in Period IV. The results were significant at one per cent and five per cent level.

The average milk procurement per day increased over the time and it was 20,304.7 litres in Period I which has grown to 163200.5 litres in Period IV and highest growth rate was observed in Period III (15.84%) due to Kshirabhagya yojana which increased demand for milk production as well to increase the functioning DCSs and to get the benefit of government subsidy which was given to support to milk producers and the lowest in Period I (0.65%) over the years due to drought conditions in both Vijayapura and Bagalkot districts. The milk procurement per society had negative growth in Period I and II (-5.15% and -2.21%, respectively), and the highest growth rate was observed in Period III (7.05%). The results were significant at a five per cent level of significance. In Period I, the average milk sales were 17726.7 litres per day, which increased to 70818.33 litres per day. The highest growth rate was observed in Period III (6.91%), which was significant at one per cent level of significance. The number of members supplying milk were 5411 in Period I and 39108 in Period IV, and the highest growth rate was observed in Period III (10.78%) and the lowest in Period IV (0.80%). The results clearly indicated increasing trend in the number of members supplying milk from Period I to Period IV and substantially high. And they were significant at a one per cent and five per cent level of significance.

The share capital contribution increased from Rs. 0.64 crores in Period I to Rs. 5.89 crores in Period IV, and the highest growth rate was observed in Period III (9.57%) over the years. The average number of members were 16147 in Period I with the highest growth rate of 6.98 per cent over the years and increased to 59829 in Period IV. And the lowest growth rate was observed in Period III (3.63%). The union should concentrate more on increasing the number of DCSs functioning instead of setting up new DCSs, because the investment made on those defunct DCSs will go to waste. If the defunct DCSs starts functioning, it will help to increase milk procurement as well as productive utilisation of capital invested, which will help in the

development of the milk union. Gunasegari and Periyasami (2013) observed that Milk collection by Pondicherry Co-operative Milk Producers' Union Limited increased from 18266460 litres in 2002-03 to 37578393 litres in 2011-2012. Between 2002-2003 and 2011-2012, milk procurement increased significantly. Manjunath and Dixit (2016) studied the growth trend and strategies for organized dairy plant in Karnataka, The compound growth rate for the years 1993–1994 to 2012–2013 was 4.03, 3.11, 4.07, 10.89, 19.56, and 27.20 per cent, respectively, in terms of the total number of DCSs operating, the total number of members of DCSs, the quantity of milk procured per day, and the quantity of liquid milk, curd, and UHT milk sold per day.

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Table 1. Progress of VIMUL over time from 1986-87 to 2021-22.

Period	Particulars	DCS Registered	DCS Functioning	Average Milk Procurement (lit/Day)	Average milk procured per society (lit/Day)	Average Milk Sales(lit/Day)	No of Members Supplying Milk	Share capital (Rs. Crores)	Total members
1986-87 to 1995-96 (Period- I)	AVERAGE	237	90	20,304.74	232.36	17,726.73	5,411	0.64	16,146
	CV(%)	17.65	17.74	11.83	17.48	14.80	21.47	18.82	20.25
	CAGR(%)	6.05***	6.12***	0.65**	-5.15***	4.74***	7.13**	6.41**	6.98**
1996-97 to 2005-06 (Period- II)	AVERAGE	321	128	20,664.62	162.01	23,228.44	11,927	1.41	26,700
	CV(%)	6.88	11.17	24.15	24.54	16.36	23.62	24.80	14.64
	CAGR(%)	2.21***	3.66***	1.37**	-2.21**	4.96**	8.33***	8.45**	4.74**
2006-07 to 2015-16 (Period-III)	AVERAGE	395	228	71,285.75	300.25	50,769	26,161	3.51	41,131
	CV(%)	9.11	23.42	48.44	26.63	20.69	29.67	26.67	12.41
	CAGR(%)	1.68***	8.31**	15.84**	7.05**	6.91***	10.78**	9.57**	3.63***
2016-17 to 2021-22 (Period- IV)	AVERAGE	435	328	1,63,200.51	497.74	70,818.33	39,108	5.89	59,829
	CV(%)	4.61	2.93	7.38	7.49	12.64	4.55	11.00	15.13
	CAGR(%)	0.43***	0.60***	1.90**	1.29**	6.36**	0.80***	6.08**	6.92**

***- significant at 1%, **- significant at 5% level of significance

Note: Previous years' progress of VIMUL since inception are shown in Appendix- 1

2. Classification of DCS based on procurement of milk

The classification of DCSs based on milk procurement is shown in Table 2. The milk producers' co-operative societies procured milk from producers, and the milk collected in various societies is sent to various chilling centres in the milk union and finally pasteurised in the main centre. The dairy co-operative societies were classified based on quantity of milk procurement per day, which started with 50 litres per day. The societies obtaining milk of 100-200 litres, 200-300 litres, 300-400 litres, 400-500 litres, and more than 500 litres were 54, 51, 38, 41, and 242, contributing 11.8, 11.2, 8.35, 9.01, and 53.18 per cent of total milk procurement, respectively. A total of 455 DCSs were there during the years 2021–22. A large procurement (53.18%), sometimes procured more than 500 litres per day. The gap between sales and procurement was discovered to be positive. And almost constant sales were there through DCSs. The procurement was fluctuating throughout the year due to flush and lean seasons, whereas the demand was almost constant. During the lean season, they obtained milk from other dairies or purchased it. The excess milk in the flush season was given to other dairies or used for processing to prepare products out of milk. It shows that they should increase procurement to meet the demand for raw milk.

Table 2. Classification of DCS based on procurement of milk for the year 2021-22.

Procurement range (lpd)	Number. of DCS	Percentage to total DCS
0-50	7	1.5
50-100	22	4.8
100-200	54	11.8
200-300	51	11.2
300-400	38	8.35
400-500	41	9.01

>500	242	53.18
Total	455	100

lpd- litres per day

3. Performance of milk procurement during the year 2021-22

The month wise milk procurement target and achievement during the years 2021–22 are shown in Table 3. The achievement with respect to procurement varied from a lowest of 80.07 per cent to as large as 94.35 per cent. The results showed that target of milk procurement was not met 100 per cent. The target achievement was highest during the months of May and June was 94.35 per cent and 91.67 per cent, respectively. And, during the months of March and August, target achievement was 80.07 per cent and 82.25 per cent, respectively, it was lowest during the fiscal year. The overall achievement was 86.87 per cent in that year.

It could be seen that the achievement in milk procurement was relatively better in the months of April, May, June, July, December and January while it was less in the months of August, September, October, November, February and March. The results are in line with the study conducted by Kotnala and Kumar (2018). March marked the highest and lowest points in the milk procurement cycle (summer). It has been discovered that milk procurement was typically low during the lean season. It gradually increased throughout the medium season and flush season.

Table 3. Performance of Procurement during the year 2021-2022 (lit/day)

Month	Target(lit)	Achievement(lit)	Percentage of achievement
April 2021	2,11,110	1,86,808	88.48
May	2,03,527	1,92,030	94.35

June	1,98,871	1,82,318	91.67
July	1,89,536	1,68,560	88.93
August	1,90,292	1,56,523	82.25
September	1,86,269	1,58,842	85.27
October	1,90,586	1,62,577	85.30
November	1,92,416	1,66,970	86.77
December	2,00,836	1,80,487	89.86
January 2022	2,11,555	1,84,353	87.14
February	2,14,768	1,77,003	82.41
March	2,14,647	1,71,879	80.07
Overall			86.87

4. Product mix of VIMUL

The Table 4 showed the milk union performance in terms of sale of fluid milk, different types of milk products and price spread of channel. Toned milk was sold for 38 rupees with a 1.90 rupees margin, standardised milk for 48 rupees with a 2.40 rupee margin, and full cream milk for 52 rupees with a 3 rupee margin. The different products produced from the milk by the union are ghee, nandini peda, Dharwad peda, curd, flavoured milk, lassi, shrikhand, kowa, mysore pak, paneer and jamun. The highest margin was kept for Nandini peda (48.21 rupees) and the lowest margin was kept for curd (1.75 rupees)

among the products. For the curd of 200 ml, they kept a margin of 2 rupees, while for the curd of 500 ml, the margin was 1.75 rupees. The Nandini peda was sold at 450 rupees per kg, while the Dharwad peda was sold at 400 rupees per kg. Patel and Prabharan (1980) indicated the

choice of pack size varied and their findings revealed that a one-litre sachet was desired by 61 per cent of people and a half-litre was liked by 20 per cent of people. Nine per cent preferred low volume packs (250 ml). Venkateswaran *et al.* (2011) investigated the brand preferences of specific FMGCs at Dindigul, Tamil Nadu. The study found that market factors including advertising, product quality, brand name, and image played a crucial role in influencing consumers' propensity to choose a particular brand.

Table 4. Product Mix of VIMUL for the year 2021-22

Sl. No.	Particulars	Dealer price(Rs)	Margin(Rs)	MRP(Rs)
	Fluid Milk			
1	Toned milk/Lit	36.10	1.90	38
2	Standardized milk/Lit	45.60	2.40	48
3	Full cream milk/lit	49.00	3.00	52
	Processed Milk Products			
1	Curds 500 ml	20.25	1.75	22
2	Curds 200 ml	8.00	2.00	10
3	Flavored milk 200 ml	16.67	3.33	20
4	Tetra pack flavored milk 250ml	16.67	3.33	20
5	Mango lassi 200 ml	16.67	3.33	20
6	Kowa / Kg	285.71	14.29	300
7	Paneer / kg	342.86	17.14	360
8	Shrikhand / kg	195.65	29.35	225
9	Ghee 500gm	222.50	22.50	245
10	Ghee/Kg	445.45	44.55	490
11	Dharwad Peda / Kg	357.14	42.86	400
12	Nandini Peda /kg	401.79	48.21	450
13	Jamoon /Kg	233.33	46.67	280
14	Mysore pak / Kg	392.86	47.14	440

5. Growth in sales of milk and its products by the VIMUL

Growth in the sales of milk products by the union across different periods is given in table 5. On the whole there was an increase in the sales performance of different milk products over time indicated in average quantities. The milk sales per day for the Period I was 17,726.7 litres, which increased to 70,818.33 litres in Period IV. It registered the highest growth rate in Period III (6.91%) due to an increase in the purchasing power of consumers and a change in food habits and the lowest in Period I (4.74%). Flavored milk had a negative growth rate in Period IV (-0.15%). The highest growth rate in Period II (14.54%) due to globalization policy which came in 1991, increased the demand for these milk products in domestic as well as foreign market and Many marketing strategies followed by the union and quality parameters followed by the union and special feel in the taste of products. Curd registered the highest growth in Period III, with a growth rate of 21.41 per cent over the ten years and the lowest in Period I (5.44%). Ghee, peda, sweet lassi and milk powder had the highest growth in Period II (13.71%), Period I (17.99%), Period II (16.55%) and Period II (13.07%) respectively, and the lowest growth rate was observed in Period I for all these products (1.06%, 1.19%, 2.31% and -0.28% respectively). This was due to private firms entered the market in the early years, employing novel marketing strategies such as high fat content, appealing packaging, and advertising. These were the main reasons for the fluctuation. Anonymous (2008) opined that the demand for value-added milk products such as probiotic drinks, cheese, and dahi (Indian yoghurt) was rising at a double-digit rate. India appeared to be able to fulfil its own needs for milk and milk products at the moment.

Table 5. Growth in sales of milk and its products by VIMUL

Period		Milk(lit/day)	Flavored milk(lit/day)	Curd(lit/day)	Ghee(lit/day)	Peda(Kg/day)	Sweet lassi(lit/day)	Milk powder(kg/day)
1986-87 to 1995-96 (Period-I)	AVERAGE	17726.75	90	322.54	75.80	115.57	101.35	66
	CV(%)	14.80	31.46	19.89	21.96	63.69	26.50	26.26
	CAGR(%)	4.74**	9.47***	5.44**	7.50**	17.99***	9.02**	8.71***
1996-97 to 2005-06 (Period-II)	AVERAGE	23228.43	344.24	661.85	246.34	611.52	294.53	168.15
	CV(%)	16.36	46.06	16.56	38.21	31.89	57.97	51.16
	CAGR(%)	4.96**	14.54***	5.69**	13.71**	11.13***	16.55***	13.07***
2006-07 to 2015-16 (Period-III)	AVERAGE	50769	849.31	1904.44	811.60	1586.94	1047.23	876
	CV(%)	20.69	12.72	78.64	25.08	21.99	23.06	31.73
	CAGR(%)	6.91**	4.31***	21.41**	9.05**	7.67***	7.95***	11.79**
2016-17 to 2021-22 (Period-IV)	AVERAGE	70818.33	1069	7948.51	1340	2405	1522.33	1552.16
	CV(%)	12.64	10.79	15.53	14.21	11.42	6.20	10.19
	CAGR(%)	6.36**	-0.15***	8.71**	1.06***	1.19***	2.31**	-0.28**

***- significant at 1%, **- significant at 5% level of significance

CONCLUSION

The highest growth rate for number of functioning DCSs, number of members supplying milk and milk procurement per day was observed in Period III. 242 DCSs were collecting more than 500 litres per day, accounting for 53.18 per cent of total procurement. The gap between sales and procurement was discovered to be positive. And almost constant sales were there through DCSs. The union should concentrate more on recommissioning of defunct DCSs than setting up of new ones, which would increase the procurement. Attention should be given on DCSs which supplies milk below 200 litres per day and increase procurement by conducting the camps and motivating the farmers by explaining the advantages of supplying milk to the union. The union should concentrate on supplying timely inputs like feed and fodder seeds and prompt veterinary services through extension agency to the milk producers. Before union could make any policy regarding the milk and milk products diversification it should undertake a consumer survey to assess the consumer's preference and market segmentation, analyze the competitors in the field.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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