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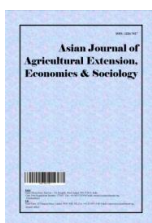
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Evolution of Dairy Cooperatives in Karnataka: A Special Focus on Women's Dairy Cooperatives

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The present research is mainly based on secondary data and aimed to study dairy cooperatives' evolution and especially those involving women in Karnataka. The indicators used in study are growth rate and percentages. In India and Karnataka, the analysis indicated that growth in milk production has increased significantly in the past 3 decades and overall, except during 2000-01 to 2009-10 period for Karnataka. As of July, 2020 there were 14 Milk Unions covering all the districts of the state with 14682 Dairy Cooperatives functioning and 25.30 lakh milk producers. Bengaluru and Kolar milk unions are larger unions in the state contributing around 25 per cent to total dairy cooperatives and milk producers in Karnataka, while contributing around 34 per cent to average milk procurement. The wide spread establishment of WDCs was possible in Karnataka through STEP scheme which was implemented by KMF with the support of Government of Karnataka. The total number of WDCs registered in Karnataka is of 4494 and currently functioning ones among them is 4046. Around 60 per cent of WDCs are set up through STEP in Karnataka over the years.

Keywords: *Development; Karnataka milk federation; STEP and women dairy cooperatives.*

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1. INTRODUCTION

India stands first among global milk producing countries since 1998 and is having largest bovine population in the world [1]. In the rural areas, dairy activity is gaining its importance as a secondary occupation of income and employment for rural families. The total dairy cooperative strength in our country is of 190,627 with 168.43 lakh milk producers and average milk procurement of 507.48 lakh kg/day (2018-19). Karnataka is having highest number of dairy cooperatives (16021) in Southern India with 25.36 lakh milk producers and milk procurement of 74.75 lakh kg/day [2].

With success of Anand Milk Union Limited (AMUL), the Government of India constituted the National Dairy Development Project (NDDB) in September, 1965 under supervision of Dr. Verghese Kurien (Father of the White Revolution in India) to replicate the Anand Pattern of Dairy Cooperatives in various parts of the country. By the idea of Dr. Verghese Kurien, 'Operation Flood' was launched by the NDDB in 1970 with the prime objectives of growth in milk production, increasing rural income and getting fair prices for the consumers [3]. Women have been at the fore front of dairy cooperative movement, which was initially carried out under the Operation Flood Programme and later under the Integrated Dairy Development Programme implemented by the Government of India. Support to Training and Employment Programme (STEP) for women was started during the year 1986 by Ministry of Women and Child Development, Government of India as one of the measures to ensure wellbeing of women in the traditional informal sector [4]. In view of above considerations, the present study was conducted for clear understanding the evolution of dairy cooperatives and women dairy cooperatives in Karnataka

2. METHODOLOGY

The study was majorly based on the secondary data collected from the various published sources of Karnataka Milk Federation (KMF), Department of Economics and Statistics, Karnataka, etc. The data regarding milk production in India and Karnataka were collected for the period from 1990-91 to 2018-19. Also latest available data regarding number of dairy cooperatives, number of dairy producers, milk procurement details and status of exclusive WDCs in Karnataka has also been collected and presented. The tools used in the study are growth rate to assess change in milk production

and percentages for easy understanding of major dairy cooperative union.

2.1 Compound Growth Rate (CGR)

To assess the variation in milk production in India and Karnataka for the period 1990-91 to 2018-19, compound growth rates were worked out using following form of exponential function-

$$Y = ab^t u_t \quad \dots (1)$$

Where,

Y = Milk production

t = time in years

u = error term

a and b are parameters to be estimated

b = (r+1)

r = compound growth rate in per cent per annum

Thus,

$$Y = a(r+1)^t u_t \quad \dots (2)$$

On making log transformation of above equation:

$$\log Y = \log a + \log (r+1) t + \log u_t \quad \dots (3)$$

$$'r' = (\text{Antilog of } b - 1) \times 100 \quad \dots (4)$$

The significance of compound growth rate (CGR) was tested by using student 't' test:

$$t = \frac{r}{SE(r)} \quad \dots (5)$$

The standard error of CGR is given by:

$$SE(r) = \frac{(100 \times b)}{\log e} SE(\log b) \quad \dots (6)$$

Where,

$$\log e = 0.4323$$

3. RESULTS

In view of establishment of the Women Dairy Cooperatives (WDCs) in Karnataka and its anticipated successful performance, there is a need to know and understand the path of development of dairy cooperatives to analyse their impact on dairy farmers in Karnataka. The present study has been presented in two sections;

1. Dairy cooperatives and their development in Karnataka

2. Women Dairy Cooperatives (WDCs) in Karnataka and their procedure of establishment

3.1 Dairy Cooperatives and their Development in Karnataka

In Karnataka, the first dairy was setup at Kudige, Kodagu District in 1955. The pilot scheme began in 1958 to cater Veterinary Hospitals and Milk process facilities at National Dairy Research Institute (NDRI) under supervision of Department of Animal Husbandry, Government of Karnataka. During the year 1962, the Bengaluru Milk Supply Scheme was started as an independent existent body. Bengaluru Dairy spread over 52 acres of area and having a capacity to process 50,000 litres of milk per day, a joint venture of UNICEF, Government of India and Government of Mysuru was gifted to the people of Karnataka on 23rd January 1965 by the then Honourable Prime Minister "late Sri Lal Bahadur Shastri". In 1974, the first International Development Agency (IDA) World Bank funded Dairy Development Program in the country was launched in Karnataka to restructure and reconcile the Dairy Industry on the cooperation principle. Karnataka Dairy Development Corporation (KDCC) was started in 1975 to implement the project initially covering 8 southern districts of Karnataka [5]. The four milk unions namely Bengaluru, Mysuru, Tumakuru and Hassan started operating from June 4th, 1975. With a target of 1800 dairy cooperative societies, the milk unions started setting up of cooperatives based on well-known 'ANAND' pattern. The first milk product dairy was started at Gejjalagare in Mandya district during 1982 and first cattle feed plant begun at Rajanakunte in Bengaluru North during 1983 [6].

Karnataka Dairy Development Corporation restructured into "The Karnataka Co-operative milk producers federated Ltd." (KMF) came into existence on May 1st, 1984 by federating the milk unions in the state and thus forming the State Level Apex Organization. During the years 1987 and 1988, dairy cooperatives at Hassan, Tumakuru, Mysuru, Bengaluru, Gejjalagere and Dharwad transferred to district milk unions. At the end of March 2000, there were around 8363 Dairy co-operative societies (DCS) organised into 13 milk unions. They were spread over 166 talukas in the 27 districts of Karnataka.

The key schemes currently involved in strengthening the dairy industry in the country are National Programme for Dairy Development (NPDD), National Dairy Plan (NDP-Phase I),

Dairy Entrepreneurship Development Scheme (DEDS), Dairy Processing and Infrastructure Development Fund (DIDF) and Animal Husbandry Infrastructure Development Fund (AHIDF). Other than centrally sponsored schemes, the state supported schemes for dairy development are Milk Incentive to Milk Producers, National Livestock Insurance, Dairy Development Fund, KMF Progeny Testing and Ksheera Bhagya.

Table 1 presents the union wise number of dairy cooperatives, number of milk producers and average milk procurement in Karnataka. As of July, 2020 there were 14 Milk Unions covering all the districts of the state with 14682 Dairy Cooperatives functioning and 25.30 lakh milk producers. The table shows that Bengaluru and Kolar milk unions are larger unions in the state contributing around 25 per cent to total dairy cooperatives and milk producers in Karnataka, while contributing around 34 per cent to average milk procurement.

Growth in milk production in India and Karnataka during the past 3 decades is shown in Table 2. Results of the analysis indicate that growth in milk production in India was positive and significant in all the decades and overall at 4 to 5 per cent per annum. Fig. 1 depicts milk production in India from 1990-91 to 2018-19 indicating stable and clear exponential growth over the years. In Karnataka, positive and significant growth in milk production was noticed during all the decades and overall except during 2000-01 to 2009-10 period. Fig. 2 represents milk production in Karnataka for the period from 1990-91 to 2018-19. It is clear from the figure that there was a sudden decrease in milk production during early 2000s and geared up steadily in the further years. Thus the results of growth in milk production of India as well as Karnataka signed of positive growth in future development of dairy industry. The results are in tune with findings of FICCI paper on development of dairy sector in India, 2020.

3.2 Growth of WDCs in Karnataka

National Dairy Development Board started Women's Dairy Cooperative Leadership Programme (WDCLP) on pilot basis in 1995 in Valsad (Gujarat), Kolhapur (Maharashtra), Goa and Waynad (Kerala). The success of the above programmes has led to replication of WDCs throughout the nation. As of March, 2019, there existed 34000 exclusive women dairy cooperative societies in the nation. Karnataka

Milk Federation initiated the STEP Programme in Karnataka from October 1997. Karnataka Milk Federation with support of Government of India had organised around 800 WDCs in the first three phases of STEP, 250 WDCs in phase IV, 224 in phase V and 200 in phase VI. Thus 1474 WDCs have been organised by KMF. In Phase VII around 200 WDCs and in Phase VIII 250 WDCs were organised into the fold of STEP. Thus 1924 WDCs are sanctioned by Government of India with a budget of Rs. 5648.08 lakhs in Karnataka. The share of Government of India is 90 per cent and implementing agency i.e. KMF and its Member Milk Unions contribute the balance 10 per cent [7]. Karnataka State Rural Livelihood Promotion Society (KSRLP) & KMF had implemented Ksheera Sanjeevini Project to register 250 WDCs (2014-15 to 2016-17). The project cost was Rs. 1710 lakhs (Rs. 1485.15 lakhs by KSRLP & Rs. 224.85 lakhs by KMF). Furthermore, KMF continued Sanjeevini project in 4 phases (2016-17 to 2019-20) registering around 411 WDCs [8].

The main characteristics of the STEP scheme are arranging training facility, providing margin money (Rs. 5000 or Rs. 10000 per target member for purchasing milch animal), and

access to awareness generation activity at village level and visit to Amul in Anand, Gujarat. The WDCs under STEP also carries out programme for the benefit of rural women, apart from milk procurement, milk marketing and providing technical input for their members. Another important characteristic of WDCs under STEP is promotion of Self Help Groups (SHG) by its Target Group Members. STEP implementation supposes formation of at least one Self-Help Groups.

Union wise number of WDCs in Karnataka as of July 2020 is given in Table 3. The total number of WDCs registered in Karnataka is 4494 and currently functioning ones among them is 4046. Around 60 per cent of WDCs are set up through STEP in Karnataka over the years. Thus the STEP bags major credit in wide spread of WDCs in Karnataka. The highest numbers of WDCs were found to be functioning in Hassan, Mandya, Shivamogga, Dharwad and Mysuru. The percentage of WDCs to total dairy cooperatives in the state was found increasing from 16.24 per cent to 26.38 per cent during the period from 2005-06 to 2019-20 (Table 4). Similar results found in the studies of Prasad and Chandrashekar [5] and Sreenivasiah [9].

Table 1. Union wise components of Dairy under Cooperative Sector in Karnataka (As of July 2020)

| Name of Union | Dairy cooperatives | | Producer members | | Milk procurement | |
|------------------|--------------------|--------|------------------|------------|------------------|--------|
| | No | % | 000' No | % to total | 000' kg/day | % |
| Bengaluru | 2191 | 14.92 | 353 | 13.95 | 1583 | 21.27 |
| Kolar | 1873 | 12.76 | 293 | 11.58 | 962 | 12.92 |
| Mysuru | 1091 | 7.43 | 216 | 8.54 | 546 | 7.33 |
| Chamarajnagar | 465 | 3.17 | 99 | 3.91 | 234 | 3.14 |
| Mandya | 1235 | 8.41 | 264 | 10.43 | 769 | 10.33 |
| Tumkuru | 1227 | 8.36 | 278 | 10.99 | 704 | 9.46 |
| Hassan | 1490 | 10.15 | 223 | 8.81 | 873 | 11.73 |
| Dharwad | 1002 | 6.82 | 140 | 5.53 | 234 | 3.14 |
| Belagavi | 609 | 4.15 | 102 | 4.03 | 186 | 2.50 |
| Vijayapura | 426 | 2.90 | 69 | 2.73 | 149 | 2.00 |
| Kalaburgi | 461 | 3.14 | 93 | 3.68 | 56 | 0.75 |
| Dakshina Kannada | 726 | 4.94 | 143 | 5.65 | 437 | 5.87 |
| Shivamogga | 1162 | 7.91 | 152 | 6.01 | 520 | 6.99 |
| Bellary | 724 | 4.93 | 105 | 4.15 | 191 | 2.57 |
| Karnataka | 14682 | 100.00 | 2530 | 100.00 | 7444 | 100.00 |

Source: www.kmfhandini.coop

Table 2. Growth in milk production in India and Karnataka from 1990-91 to 2018-19

| Particulars | 1990-91 to 1999-00 | 2000-01 to 2009-10 | 2010-11 to 2018-19 | Overall |
|-------------|--------------------|--------------------|--------------------|---------|
| India | 4.34*** | 4.29*** | 5.59*** | 4.37*** |
| Karnataka | 7.87*** | 0.02 ^{NS} | 4.93*** | 3.58*** |

Note: *** indicates 1 per cent level of significance and NS indicates non-significant

Source: Authors' computed

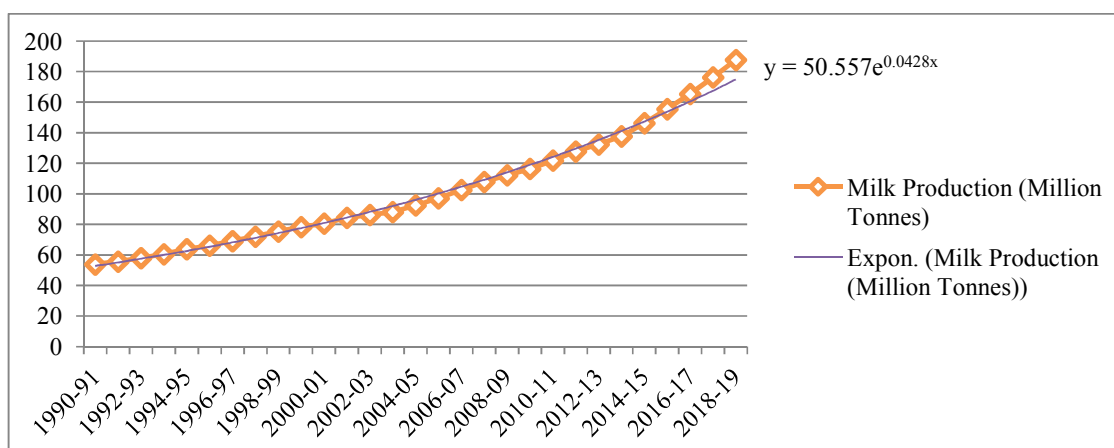


Fig. 1. Milk production in India for the period from 1990-91 to 2018-19

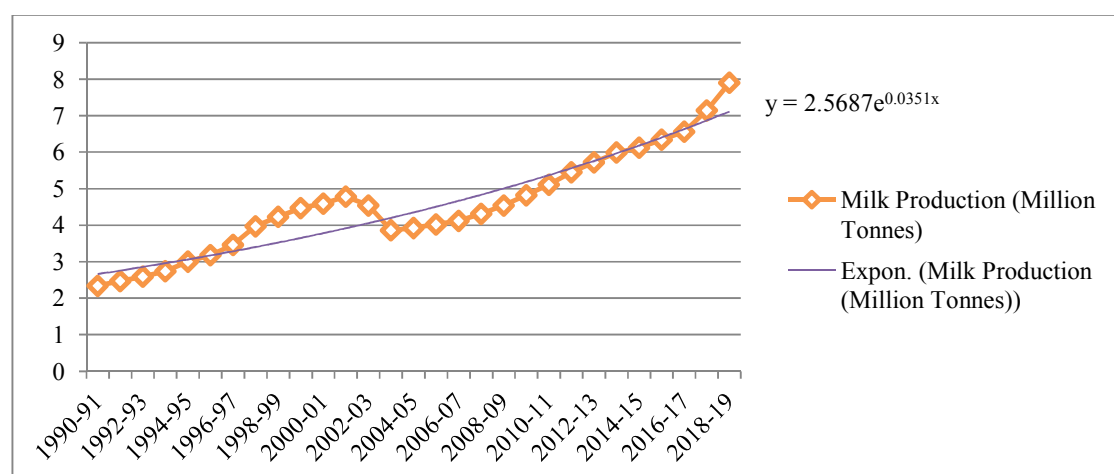


Fig. 2. Milk production in Karnataka for the period from 1990-91 to 2018-19

Table 3. Status of exclusive WDCs in milk unions of Karnataka (As of July, 2020)

| Name of Union | Registered | | | Functioning | | |
|------------------|------------|----------|---------------|-------------|----------|---------------|
| | STEP | Non-STEP | Total | STEP | Non-STEP | Total |
| Bengaluru | 191 | 41 | 232 (5.16) | 186 | 40 | 226 (5.59) |
| Kolar | 172 | 72 | 244 (5.43) | 161 | 33 | 194 (4.79) |
| Mysuru | 242 | 136 | 378 (8.41) | 240 | 133 | 373 (9.22) |
| Chamarajnagar | 69 | 32 | 101 (2.25) | 68 | 24 | 92 (2.27) |
| Mandya | 307 | 250 | 557 (12.39) | 305 | 246 | 551 (13.62) |
| Tumkuru | 204 | 118 | 322 (7.17) | 203 | 96 | 299 (7.39) |
| Hassan | 313 | 399 | 712 (15.84) | 304 | 375 | 679 (16.78) |
| Dharwad | 167 | 224 | 391 (8.70) | 151 | 179 | 330 (8.16) |
| Belagavi | 123 | 66 | 189 (4.21) | 81 | 92 | 173 (4.28) |
| Vijayapura | 103 | 1 | 104 (2.31) | 65 | 14 | 79 (1.95) |
| Kalaburgi | 178 | 119 | 297 (6.61) | 119 | 37 | 156 (3.86) |
| Dakshina Kannada | 173 | 27 | 200 (4.45) | 173 | 27 | 200 (4.94) |
| Shivamogga | 200 | 240 | 440 (9.79) | 189 | 223 | 412 (10.18) |
| Bellary | 143 | 184 | 327 (7.28) | 130 | 152 | 282 (6.97) |
| Karnataka | 2585 | 1909 | 4494 (100.00) | 2375 | 1671 | 4046 (100.00) |

Source: www.kmf.nandini.coop

Table 4. Number of WDCs in Karnataka over the years

| Year | No. of dairy cooperatives | No. of WDCs | % of WDCs in total dairy cooperatives |
|---------|---------------------------|-------------|---------------------------------------|
| 2005-06 | 8674 | 1409 | 16.24 |
| 2009-10 | 10415 | 2285 | 21.94 |
| 2015-16 | 14826 | 3949 | 26.64 |
| 2019-20 | 16071 | 4239 | 26.38 |

Source: www.kmfhandini.coop and Sreenivasaiah, [9]

3.2 Procedure for Establishment of WDC

The WDCs are established in the villages where no other dairy cooperatives exist. Only the women dairy entrepreneurs are allowed to become member of WDC. The men dairy entrepreneurs can encourage any women member of their household to become member of the WDC. For establishment of new WDC at village level, there are many steps to be followed at various stages. The detailed procedure has been explained in the following four sections;

3.2.1 Village survey details

The detailed information of the village (where WDC is proposed) is submitted to district milk union as per their scheduled pattern of application. The details like complete village address, number of families, population, number of dairy farmers, types of animals, estimated milk yield, existence of dairy cooperative in the village, if any, previously and so on are to be submitted.

3.2.2 Documents to be submitted with village meeting proposal

The documents to be submitted are resolution copy and attendance details of village meeting, promoters' (atleast 10 people) list, with signature of village president certified by milk union officers, certified copy from milk union officers mentioning that village is devoid of dairy cooperative, release document if any dairy cooperative existed earlier, request letter from the main promoter along with 3 photos and identity card and recommendation letter from key area officer. After getting nod from district milk union, the WDC can go for registration and commencement.

3.2.3 Documents to be submitted for registration of WDC proposal

The requisite documents for registration of WDC proposal at respective jurisdictional district registrars/ registrar of society office are schedule

triplets of shareholders, filled sample bylaws, schedules and appendices, request letter from the main promoter, recommendation letter from key area officer, deposit details of share money in the bank, redemption details of village member shares of earlier dairy cooperative if any and resignation letter of newly elected representative of WDC from the post she held in the earlier dairy cooperative if any existed.

3.2.4 Documents to be submitted while beginning the WDC activity

The document submission to be taken care of while commencing the WDC activity are registration certificate, dairy election results copy, elected representatives and authorised signatories' detail, first key meeting details, first working meeting discussion details, employees appointment and their training details, shareholders recommendation details, fixation of timing details, WDC starting date and the key area officer details, the infrastructure requirement details and the WDC building, name board and milk testing equipment details are to be submitted minimum one week before to the district milk union office.

4. CONCLUSION

The results of growth in milk production of India as well as Karnataka showed positive indication of further development of dairy industry. The wide spread establishment of WDCs was possible in Karnataka through STEP scheme which was implemented by KMF with the support of Government of Karnataka. The dairy cooperatives are playing a vital role in improving the socio-economic conditions of milk producers in the rural areas by local milk procurement and fair price policy [9].

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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