Constraints faced by the dairy farmers in production and marketing of milk in northern dry zone of Karnataka

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Abstract: The present study investigated production and marketing related constraints of dairy farming practice in Northern Dry Zone of Karnataka. The study covered 240 sample households selected randomly from four districts of Northern Dry Zone of Karnataka. About 66 per cent of dairy farmers belongs to marginal (32.50%) and small (33.75%) category. The study also revealed that the 93.75 per cent, 91.66 per cent and 87.91 per cent dairy farmers were facing high cost of feed and fodder, non-availability of quality feed round the year and susceptibility of crossbred animals to disease were the major production related problem, respectively. It was also noted that, the distant location of milk collection center (96%), low price of milk (92.50%), inadequate availability of regular market (91.25%), spoilage of milk due to poor hygiene and storage problem while carrying milk to procurement centre (83.33%) were the major constraints in marketing of milk. Thus efforts should be focused on making availability of quality feed round the year along with the improvement of marketing infrasture is win-win situation for development of dairy sector in the Northern Dry Zone of Karnataka.

Keywords: Co-operatives, Dairy, Income, Milk production, Marketed Surplus, Productivity

Introduction

The rain-fed farming continues to be critical for meeting the livelihood needs of a vast majority of resource-poor farmers in the chronically drought-prone areas of the country. The recent years have been experiencing recurring droughts and ill-distributed precipitation adversely affecting agricultural production, income and employment. At present, 68 per cent of the total geographical area of the country is prone to drought in varying degrees and about 33 per cent of it is chronically drought-prone (rainfall is less than 650 mm). Hardly, 29 per cent of the total cropped area in drought-prone districts is irrigated as against the all India average of 41 per cent (Kekene, 2014).

The livestock sector holds a great promise in providing income and employment particularly in drought prone areas (Nagarale, et al. 2015). It is interesting to note that the growth in livestock income has always been higher than the growth in crop income, even during the heydays of Green Revolution when the policy emphasis was largely on crop production. Livestock provides livelihood to two-third of rural community. It also provides employment to about 9.20 per cent of the population in India (Livestock Census Report, 2017). Among all the possible livestock enterprises dairy farming is most popular and successful venture. It assumes greater relevance in providing 'drought proofing' and ensuring income and employment for sustainable rural livelihood (Patel, 1993). According to Shukla and Brahmankar (1999) milk production contributes on an average 27 per cent of household income and their contribution varies from about 19 % in case of large scale farmers to about 53 per cent in the landless Category. Thus, dairy production has become an important component of rural development programmes in the rainfed areas of India, and is considered as an instrument for socioeconomic change to improve as income and quality of life (Nagarale, et al. 2015). During 2018-19, milk production in the country recorded 187.70 million tonnes. The per capita availability of milk increased from 112 gm per day in 1968-69 to 394 gm in 2018-19 (NDDB, 2019-20). The country has to step up efforts for increasing milk production and other dairy products owing to growing demand for them (Rangnekar, 2006).

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The productivity of dairy animals in dry farming conditions is low despite their large contribution to the total milk pool. Prospects of dairying under dry zone conditions would greatly benefit the resource-poor farmers and minimize their migration to cities in search of livelihood. Further, this sector can make significant contribution in promoting redistributive effect on income in favour of weaker sections in general. The examining constraints in dairy farming is not only important for producers but also serves as important bases for planning and policy purposes with a view to generate economic information's useful for projecting development activities in the dairy sector.

Constraints imply the problems faced by dairy farmers while adopting day-to-day animal husbandry practices in their dairy enterprises. If these constraints are identified, they are helpful to bridge the gap between dairy technology and its adoption by dairy farmers (Rathod et al. 2014). Keeping above facts in view, the present study has been undertaken with the objective to identify the major constraints faced by dairy farmers so that the findings could be used in upliftment of dairy enterprise in Northern Dry Zone of Karnataka.

Materials and Methods

The proposed study was undertaken in Vijayapura, Bagalakot, Ballary and Koppal districts of Northern Dry Zone of Karnataka which would adequately represent the region. The district were purposively selected owing to the fact that the dairy development pace in selected districts was not as progressive as in the districts of southern region. Yet, dairy farming plays an important role in the rural economy of selected districts; where in about 27 per cent of the total household income is derived from livestock farming. In second stage from each district, four villages were selected randomly. For uniform representation dairy farming practices in each districts villages were selected in a way that, two villages from high bovine density area and two villages from low bovine density area. In third stage random sampling technique were employed in selection of fifteen dairy farming households from each village, and the total sample size was 240 dairy farming households. The required information was recorded with the aid of pre tested & well-structured interview schedules. The total milk produced by all milch animals in households was reckoned as per day milk production for household.

Herd size

The herd size and the number of milch animals in the study area comprised of crossbred cows, local cows and buffaloes. The cattle population comprised of milch animals, heifers, and young stock (*i.e.* calves <1 year and calves >1 year age). In order to have an appropriate comparison, the herd size maintained by different categories of households were converted into number of Standard Animal Unit (SAU) using the conversion co-efficient factor suggested by Sirohi et al. 2015. (Table 1).

Garrett's ranking technique

To find out the constraints faced by the farmers in production and marketing of milk in the study area, the Garrett's ranking technique (Woodworth, 1969) was used. Various constraints were framed for the study keeping in view the reports from the available literature. Accordingly, constraints were identified and sub divided into production and marketing related constraints for arriving at the response from the farmers.

The constraints were prioritized by using Garrett's ranking technique in the following manner:

$$\text{Percentage position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given for the i^{th} item by the j^{th} , respondent and

N_j = Number of items ranked by the j^{th} , respondent

The percentage position of each rank was converted into scores using Garrett table. For each constraint, scores of individual respondents were added together and divided by total number of respondents for whom scores were added. Then, mean score for each constraint was ranked by arranging them in the descending order.

Results and Discussion

Socio-economics profile of sample households

Among 240 dairy farming households, about 66 per cent of dairy farmers belongs to marginal and small category. The average size of the family in the study area was 6.80 which varied from 5.11 in marginal farmers to 9.17 in large farmers. About 80 per cent of the sample households had male as head of the family and further it was observed that 55 per cent of the head of the households' age was in the range of 40 to 60 year. Similar findings were reported by Raval and Chandawat (2012). The illiteracy rate was higher (38.46 %) in the case of landless dairy farmers and lowest (31.25 %) in the case large category of dairy farmers. Only 5.83 per cent of dairy farmers studied up to degree and above. Similar findings were observed by Ranganath (2008) found that only 7 per cent dairy farmers had attained graduation degree or above. The average operational land holding of the sample households in the study area was 2.91 ha. Agriculture was the main occupation for 46.25 per cent of households. With respect to subsidiary occupation, about 50 per cent of sample households practiced

dairy as subsidiary occupation. Similar findings was reported by Shinde (2014) found 51 per cent of households in both irrigated and non-irrigated region occupied dairying as subsidiary occupation.

Average herd size across the different categories of farmers

The average herd size varied from 1.87 Standard Animal Units (SAU) in the case of landless farmers to 6.40 SAU in the case of large farmers for buffaloes. Buffaloes formed larger percentage in the total herd size (Table 2). On an average, the number of buffaloes was 4.02 SAU for all categories of farmers in northern dry zone of Karnataka. Crossbred cattle was the next in dominance after the buffaloes with average herd size of 2.92 SAU which varied from 1.99 SAU in the case of landless farmers to 3.56 SAU in the case of large farmers. The average milch animals (crossbred) in all categories of farmers were 1.64 units whereas in the case of buffaloes it was 2.70 SAU. It was further observed that, in the case of buffaloes, percentage of milch animals to the total animal was around 67.16 per cent and it was 56 per cent and 31 per cent for crossbred and local cow, respectively.

The local cows formed the only 13 per cent of total herd size in the study area (Figure 1). The important reason for paltry share of local cows in the total herd size could be due to greater emphasis of mechanization of agriculture in the study area resulting in lower effective demand of quality draft animals. Another attributable factor is the replacement of less profitable local cows with buffaloes and crossbred cattle for meeting the increasing demand of milk by the organized and unorganized dairy sector.

Average daily milk yield of different species of milk animal

The average daily milk yield of local cow varied from 2.58 litres in marginal farmers to 3.01 litres in large farmers. The overall average milk yield for all categories of farmers put together was 2.86 litres per animal per day in the case of local cattle. The average daily milk yield of crossbred cows varied from 7.55 litre in the case of landless farmers to 8.83 litre in the case of medium farmers (Table 3). The overall average milk productions for all categories of households were found to be 8.38 litre per animal per day. In the case of buffaloes, milk yield was observed to be marginally higher at 4.58 litres in medium farmers followed by large farmers, small farmers, marginal farmers and landless farmers with a milk yield of 4.56 litre, 4.49 litre, 4.41 litre and 4.02 litre, respectively. Average milk production per day was observed to be highest in crossbred cows (8.38 litre) followed by buffaloes (4.51 litre) and local cows (2.86 litre) (Table 3).

Constraints in dairy farming practices

Constraints imply the problems or difficulties faced by dairy farmers while adopting animal husbandry practices in their dairy enterprise. The constraints in milk production and disposal in the present study refer to all factors which may be social; economic organizational that individually or collectively hinder farmers from going for scientific dairy farming practices. Constraints are studied under two categories *i.e.*, constraints in the milk production and constraints in marketing of milk.

Constraints in the milk production as perceived by the households

From the Table 4, it was observed that majority of respondents *i.e.*, 93.75 were facing high cost of feed and fodder. This may be due to the fact that the demand for dry fodder and green fodder

Table 1. Standard animal units for southern India

Animals	Localcow	Crossbredcow	Buffalo
Adult male (≥ 3 years)	0.97	1.12	1.04
Adult female (≥ 3 years)	1.00	1.62	1.24
Young stock male (< 1 year)	0.22	0.24	0.24
Young stock female (< 1 year)	0.27	0.3	0.28
Young stock male (> 1 year)	0.54	0.63	0.6
Young stock female (> 1 year)	0.47	0.52	0.51
Heifer	0.82	0.86	0.77

Table 2. Average herd size on sample households

Categories	Crossbred cattle				Local cattle				Buffaloes								Grand
	Dry	Milch	Young	Other	Dry	Milch	Young	Other	Dry	Milch	Young	Other	Dry	Milch	Young	Other	
Landless	0.36	1.3	stock	0.01	1.99	0.32	0.12	stock	0.06	0.72	0.25	1.32	stock	0.08	1.87	total	
Marginal	0.32	1.38	0.39	0.8	2.89	0.36	0.14	0.22	0.11	0.83	0.32	1.74	0.24	0.03	2.33	6.05	
Small	0.69	1.52	0.58	0.16	2.95	0.38	0.38	0.16	0.06	0.98	0.82	2.82	0.32	0.16	4.12	8.05	
Medium	0.68	1.92	0.52	0.12	3.24	0.36	0.48	0.32	0.14	1.3	1.12	3.66	0.38	0.24	5.40	9.94	
Large	0.72	2.12	0.58	0.14	3.56	0.48	0.52	0.25	0.11	1.36	1.38	3.98	0.56	0.48	6.40	11.32	
overall	0.55	1.64	0.47	0.24	2.92	0.38	0.32	0.23	0.09	1.03	0.77	2.70	0.34	0.19	4.02	7.97	

Fig. 1 Proportion of different bovine species in total herd size

Table 3. Average daily milk yield of different milch animal species (litre/animal/day)

Type of Animal	Categories					Overall
	landless	Marginal	Small	Medium	Large	
Local Cows	2.58	2.85	2.98	2.88	3.01	2.86
Crossbred Cows	7.55	8.26	8.46	8.83	8.81	8.38
Buffaloes	4.02	4.41	4.49	4.58	4.56	4.41

Table 4. Constraints in milk production as perceived by the households

Sr.No.	Particulars	Meanscores	Rank
1	High cost of feed and fodder	93.75	I
2	Non- availability of quality feed and fodder round the year	91.66	II
3	High susceptibility of crossbred animal to disease	87.91	III
4	Lack of A.I. and veterinary facilities near to village	83.75	IV
5	High cost of obtaining veterinary aid at doorstep	79.58	V
6	Poor knowledge of improved management practices (feeding, breeding <i>etc</i>)	77.91	VI
7	Low productivity in local cows and buffaloes	74.16	VII
8	High purchase value of crossbred cow	68.33	VIII
9	Inadequate of availability of extension	67.08	IX
10	Non-availability of grazing land	65.41	X

rise in summer season would cause price rise of fodder and farmers would use more concentrate at high rate. Whereas 91.66 per cent respondents stated that non-availability of quality feed and fodder round the year. This might be because of the fact that northern dry zone of Karnataka more prone to drought and successive drought for the past two years brought down the production of green fodder which lead to scarcity of green fodder. About 87.91 per cent of farmers conveyed that susceptibility of crossbred animals to disease followed by lack of artificial insemination and veterinary facilities near to village (83.75%), high cost of obtaining of veterinary services at door step (79.58%), poor knowledge of improved management practices (77.91%). Low productivity in local cows and buffaloes (74.16%), high purchase value of crossbred cows (68.33%). Whereas 67.08

per cent of respondents were facing inadequate availability of extension services and only 65.41 per cent of respondents stated their constraint as non-availability of grazing land (Table 4). Similar findings were also reported by Michael et al. (2012) high cost of feed and fodder and non-availability of green fodder were major constraint of dairy farming. Rathod et al. (2009) reported that, non-availability of fodder around the year and lack of timely AI facility as major institutional constraint. Sonpasare et al. (2011) found lack of availability of green fodder as major constraint faced by the dairy farmers. Mohapatra et al. (2012) found lack of veterinary facilities was important constraint.

Table 5. Constraints in milk marketing as perceived by the households

Sr. No.	Particulars	Meanscores	Rank
1	Distant location of milk collection center	96.25	I
2	Low price of liquid milk	92.5	II
3	Inadequate available of regular market	91.25	III
4	Spoilage of milk due to poor hygiene and storage problem	83.33	IV
5	Delay in payment from co-operative society	79.58	V
6	High transport cost to delivery of milk to procurement center	74.58	VI
7	High penalty from co-operative society	71.25	VI
8	Nepotism in the society	69.58	VII
9	Price of milk is always based on the fat content from co-operative society	63.75	IX
10	Lack of transparency in fat measuring and pricing of milk	61.25	X

Constraints in the milk marketing as perceived by the households

The study also revealed that that distant location of milk collection center (96.25%) was the main marketing constraint (Table 5). Other constraints are low price of milk (92.50%) followed by inadequate availability of regular market (91.25%), spoilage of milk due to poor hygiene and storage problem while carrying milk to procurement centre (83.33%) were the major marketing related constraints. Whereas, 79.58 per cent of respondents stated their constraint as delay in payment from co-operative societies. This may be due to the fact that the society credits the amount once in week or fortnight. About 74.58 per cent conveyed their constraint about high transportation cost or lack of transport facility for selling of milk to collection center. About 71.25 per cent of respondents stated their constraint as high penalty from co-operative society for spoilage or poor hygiene of milk. This may be because of majority of respondents had poor knowledge of scientific and clean milking method. Whereas 69.58 per cent of respondents expressed their constraints as nepotism in the societies followed by price of milk is always based on the fat content of milk from co-operative society (63.75%) and lack of transparency in fat measuring and pricing of milk (61.25%). The findings of constraints in marketing are in conformity with the results of Rathod et al. (2009), Jaya et al. (2012), Michael et al. (2012), Shisode et al. (2009) found lack of transport facilities as important constraint, Subhadra et al. (2009) reported low price of milk as major marketing constraint, Mohapatra et al. (2012) reported low milk price and poor marketing facilities as major constraint

Conclusions

The study concluded that, the important constraints faced by the dairy farmers in Northern Dry Zone of Karnataka were, high feed cost (93.75%), non-availability of quality feed round the year (91.66%). Therefore government must initiate adequate steps to increase area under fodder crops and to resolve constraints

faced by dairy farmers through development of veterinary facilities as majority farmers expressed that susceptibility of crossbred animals to disease, lack of artificial insemination and veterinary facilities near to village. Whereas in case of marketing of the milk, distant location of milk collection center, low price of milk, inadequate availability of regular market were the major constraints. Taking these constraints in consideration, effort should made to increasing the number of procurement centers, providing the remunerative price by ensuring the regular market is an need of the hour to improve the dairy farming in Northern Dry Zone of Karnataka.

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