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Constraints analysis of dairy entrepreneurial ecosystem as perceived by women dairy entrepreneurs of Karnataka: A severity score approach

¹Priyanka BN, ²MCA Devi, ³S Subash and ⁴M Sivaram

¹Doctoral Research Scholar, Dairy Extension Division, ICAR-National Dairy Research Institute, Southern Regional Station, Bengaluru, Karnataka, India

²Principal Scientist, Dairy Extension Division, ICAR-National Dairy Research Institute, Southern Regional Station, Bengaluru, Karnataka, India

³Senior Scientist, Dairy Extension Division, ICAR-National Dairy Research Institute, Southern Regional Station, Bengaluru, Karnataka, India

⁴Principal Scientist, Dairy Economics and Statistics Section, ICAR-National Dairy Research Institute, Southern Regional Station, Bengaluru, Karnataka, India

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Corresponding Author: MCA Devi

Abstract

In recent years, women have been venturing into the dairy business and contributing to household income and nutrition. But, many constraints related to input supply, finance, labour, processing, marketing, and household responsibilities are often impeding the functioning of their dairy enterprise. In this regard, the present study was conducted to identify and prioritize the constraints faced by women entrepreneurs in running their dairy enterprise in Karnataka State. Unlike ordinary milk suppliers to cooperatives, the respondents in this study had their own customer base and engaged in direct and relatively innovative marketing of milk and dairy products. A purposive and snowball sampling methods were employed to get data from a total of 108 women dairy entrepreneurs. Data were collected using a structured interview schedule which encompasses institutional, financial, socio-cultural, human capital, managerial, production, procurement, processing, marketing, and shock and crises related constraints. Severity index and Garrett ranking technique were used for analysis. The study revealed that shock and crisis-related constraints scored the highest category-wise severity index of 80.69, followed by production-related constraints (80.03) and financial constraints (78.60). High cost of feed, fodder, medicines and other dairy inputs ranked first in overall Garrett ranking with a mean Garrett score of 60.13. Rising input prices during crisis situations, non-availability of affordable green fodder, challenges in obtaining profitable price for milk or dairy products and time constraints resulting from multiple household and enterprise responsibilities were identified as major constraints. The study concludes that women dairy entrepreneurs require comprehensive support in input cost management, fodder development, access to formal credit, processing infrastructure, direct marketing, branding, customer retention, and time-saving enterprise support.

Keywords: Women dairy entrepreneurs, dairy entrepreneurial ecosystem, severity index, Garrett ranking, direct marketing, Karnataka

Introduction

Dairying is one of the important livelihood and enterprise activities in rural India. The livestock sector makes a substantial contribution to agricultural income and rural employment, while dairy activities ensure a regular cash flow for small and marginal farm households (1). In Karnataka, the dairy sector benefits from a strong institutional framework, including animal husbandry services, veterinary institutions, milk procurement systems, and dairy development programmes (2). However, women's dairy entrepreneurship extends beyond supplying milk to organized channels. Many women independently manage dairy enterprises, involved in sale of milk and dairy products directly to consumers, and develop their own customer base through trust, product quality, local reputation, delivery and product differentiation. This study examines such independent women dairy

entrepreneurs. The respondents were not mainly selling milk to dairy cooperatives. These entrepreneurs demonstrate greater innovation in marketing, engaging in direct customer sales, production of value-added dairy products, local delivery, and customized orders. Consequently, their challenges differ from those faced by conventional dairy farmers or cooperative milk suppliers. They must manage not only production, but also pricing, packaging, customer identification, quality maintenance, payment collection, and customer retention.

The dairy sector depends on factors like input costs, fodder supply, animal health, milk prices, and consumer demand. National dairy sector reports show that dairy performance is influenced by climatic conditions, milk price regime, feed ingredient prices and market demand (3). At the enterprise level, product price, brand image, packaging, availability, and customer satisfaction are especially important for those

selling directly to consumers (4). Feed and fodder supply is still a major challenge for livestock enterprises, and studies have emphasized the need for systematic assessment of feed and fodder availability and requirement (5).

Against this background, the present article was prepared with the objective to identify and prioritise the constraints in the dairy entrepreneurial ecosystem faced by independent women dairy entrepreneurs in Karnataka.

Methodology

Research design

The study followed a descriptive survey research design. This approach was deemed appropriate as the aim was to identify, assess, and prioritise the constraints perceived by women dairy entrepreneurs within the dairy entrepreneurial ecosystem.

Locale of the study

The study was conducted in Karnataka, a State known for its robust dairy industry and a significant involvement of

women in milk production, processing, and local dairy marketing. However, the present study specifically focused on women dairy entrepreneurs who were operating with their own customer base rather than depending mainly on cooperatives for selling milk.

Selection of respondents

A total of 108 women dairy entrepreneurs were included in the study. Since there was no complete sampling frame of independent women dairy entrepreneurs selling milk and dairy products to their own customers, purposive and snowball sampling methods were used. First, women dairy entrepreneurs involved in production, processing, procurement, and marketing were identified through local contacts, field functionaries, and referrals from their respondents. Additional respondents were identified through snowball references. Post data collection, the respondents were classified according to their entrepreneurial activity as shown in Table 1.

Table 1: Distribution of respondents based on their entrepreneurial activity profile

Sl. No.	Entrepreneurial activity	No. of respondents	Percentage
1	Production + Marketing	26	24.07
2	Production + Processing + Marketing	60	55.56
3	Procurement + Processing + Marketing	17	15.74
4	Procurement + Marketing	5	4.63
	Total	108	100.00

Interview schedule and measurement of constraints

Data were collected using a structured interview schedule developed for the study. The schedule included profile of women dairy entrepreneurs and ten major categories of constraints, namely, institutional, financial, socio-cultural, human capital, managerial, production, procurement, processing, marketing, and shock and crisis-related constraints, that were asked from respective respondents relevant to their activity profile.

The severity of each applicable constraint was measured on a five-point continuum: 1 = Not a constraint, 2 = Minor constraint, 3 = Moderate constraint, 4 = Serious constraint and 5 = Very serious constraint. After scoring the severity of applicable constraints, the respondents were asked to rank the most serious constraints faced by them and were analysed using Garrett ranking technique.

Applicability of constraint sections

Since all respondents were not involved in all dairy activities, applicability of particular sections was considered carefully. Institutional, financial, socio-cultural, human capital, managerial, marketing and shock-related constraints were applicable to all 108 respondents, while, production-related constraints were applicable to 86 respondents, procurement-related constraints to 22 respondents and processing-related constraints to 77 respondents.

Data analytical tools

The collected data were analysed using frequency, percentage, mean severity score, severity index, and Garrett ranking technique.

The severity index was calculated using the following formula:

$$\text{Severity Index} = \frac{\text{Mean Severity Score}}{5} \times 100$$

Where, 5 = Maximum Possible score

Garrett ranking was used to convert ranks into scores and to identify the priority order of constraints. The per cent position was calculated by using the following formula (8):

$$\text{Per cent Position} = \frac{[100(R_{ij} - 0.5)]}{N_j}$$

Where,

R_{ij} = Rank given for the i^{th} constraint by the j^{th} respondent

N_j = Total number of constraints ranked by the j^{th} respondent

The per cent positions were then converted into Garrett scores using Garrett's conversion table. The mean Garrett score was calculated for each constraint, and the constraints were ranked in descending order of mean Garrett score.

Results

Profile of the respondents

The respondents were fairly distributed across age groups, with significant per cent belonging to the age group of 36 to 46.80 years (40.74%), followed by a considerable per cent above 46.80 years (34.26%) and one-fourth of the respondents belonged to younger age category below 36 years (25.00%). All the respondents had an educational profile with none in the illiterate category; higher secondary education was the most common level (30.56%), followed by high school (25.00%) and graduation (22.22%). More than half of the respondents had medium-sized families of 5

to 6 members (50.93%), and the majority belonged to nuclear families (83.33%). Most of the women dairy entrepreneurs were married (87.96%), indicating that dairy enterprise was largely managed along with family responsibilities. More than half of the respondents had medium level of experience of 4 to 8 years in dairy/agribusiness activities (53.70%). In terms of ownership profile, more than half of the respondents (55.56%) operated as sole owners, while a significant per cent (44.44%) were involved in partnership-based enterprise activity. The dairy entrepreneurial activity profile of the respondents revealed that more than half of the respondents were engaged in production, processing and marketing collectively (55.56%), followed by nearly one-fourth in production and marketing (24.07%), indicating the involvement of the respondents in more than one stage of

the dairy value chain (Table 1).

Category-wise severity index of constraints

The category-wise severity index of constraints is presented in Table 2. Shock and crisis-related constraints recorded the highest severity index of 80.69, followed by production-related constraints with 80.03. Financial constraints ranked third with a severity index of 78.60. Human capital constraints ranked fourth with 77.22, followed by marketing constraints with 76.30. Processing-related constraints recorded a severity index of 76.01, while procurement-related constraints recorded 75.84. Institutional, socio-cultural and managerial constraints recorded comparatively lower severity index values of 72.44, 70.56 and 69.81, respectively.

Table 2: Category-wise severity index of constraints

Rank	Constraint category	Applicable N	No. of items	Mean severity score	Severity index
1	Shock and crisis	108	7	4.03	80.69
2	Production	86	8	4.00	80.03
3	Financial	108	7	3.93	78.60
4	Human capital	108	4	3.86	77.22
5	Marketing	108	9	3.81	76.30
6	Processing	77	8	3.80	76.01
7	Procurement	22	7	3.79	75.84
8	Institutional	108	5	3.62	72.44
9	Socio-cultural	108	6	3.53	70.56
10	Managerial	108	6	3.49	69.81

The results reveal that the most severe constraints were related to crisis, production and finance, which imply that women dairy entrepreneurs were mainly affected by input price rise, fodder shortage, production cost, credit access and other enterprise-level economic problems.

Major item-wise constraints

Among the financial constraints, limited access to credit from formal financial institutions emerged as the major problem with the highest severity index of 83.20. This was followed by the requirement of collateral or guarantor for obtaining loans with a severity index of 82.40, and lengthy and complicated procedures for availing loans with 80.40. This highlights the issues faced by the respondents in not only in getting credit, but also in fulfilling the formal requirements relating to sanction of loan. For many small and independent women entrepreneurs, collateral, documentation and procedural delay may become a barrier for expanding their dairy enterprise.

In case of institutional constraints, limited awareness about institutional schemes and support services were ranked first with a severity index of 75.60. Lack of follow-up support from institutions after training was ranked second (74.40) that denote lack of continuous institutional support for women entrepreneurs at the time of need. This further implies that when training or schemes are available, the benefit reach is meagre with gap in information access, guidance, and follow-up support at the requisite time.

Marketing constraints were also found to be important for the respondents with their customer base and not dependent on dairy cooperative societies, a major channel of milk marketing. Difficulty in getting profitable price for milk or

dairy products recorded the highest severity index of 89.00. Delay in payment from customers ranked second with 80.60, followed by lack of proper transport facilities for marketing (78.40) and difficulty in identifying, attracting, and retaining customers (78.00). These findings connote that independent dairy marketing gives women entrepreneurs more opportunity, parallelly creates issues related to pricing, management of customers, transport, payment collection, and market competition.

Under shock and crisis-related constraints, increase in the price of feed, fodder, medicines, and other inputs during crisis situations was the most severe constraint with a severity index of 89.60. Price fluctuation of milk and dairy products ranked second with 82.20, followed by difficulty in procuring dairy inputs during crisis situations (81.80). This denote that crisis situations affected both the production and marketing side of dairy enterprises, which may further effect cost of inputs leading to uncertainties in demand, price, and supply conditions.

Among the socio-cultural constraints, time constraint due to multiple household and enterprise responsibilities ranked first with a severity index of 85.80. This finding is important in terms of the gender-specific nature of the constraints faced by women dairy entrepreneurs. Women were not only managing dairy enterprise activities, but also household responsibilities. Due to dual workload pressure, their time for crucial activities like training, marketing, record keeping, customer handling, and enterprise expansion might be constrained and impaired.

In production-related constraints, high cost of feed, fodder, medicines, and other dairy inputs recorded the highest severity index of 93.40, followed by non-availability of

affordable green fodder throughout the year (87.60) and delayed access to veterinary and breeding services (81.20). These results further infer that input cost, fodder availability and timely animal health services were the major production-level problems faced by the respondents. As production cost directly affects the profit, said constraints are very critical for the sustainability of dairy enterprises. With respect to human capital constraints, high cost of labour was ranked first with a severity index of 83.40. Non-availability of reliable and skilled labour for routine dairy enterprise activities was the second important constraint with a severity index of 79.20. This in turn denotes the cost component and access to labour as crucial constraints. Since dairy activities need regular attention, with round the clock activities of feeding, cleaning, milking, processing and delivery, shortage of dependable labour can directly affect the day-to-day functioning of the core business activities. Among the processing-related constraints, high cost of processing equipment ranked first with a severity index of 83.60. Difficulty in maintaining quality and shelf-life of processed dairy products ranked second with 80.60. This indicates that value addition in dairy demands investment, technical competency, quality maintenance and proper storage facilities. Similarly, among procurement-related constraints, high transportation cost in milk procurement ranked first with a severity index of 80.00, which further indicates transport cost as major factor of concern for the respondents involved in procurement, as milk has to be collected and transported within a short period of time to

avoid spoilage and quality loss.

Overall Garrett ranking of major constraints

The overall Garrett ranking of the prioritised constraints faced by the women entrepreneurs is presented in Table 3. High cost of feed, fodder, veterinary medicines and other dairy inputs with a mean Garrett score of 60.13 was ranked as the major constraint, followed by spiking price of feed, fodder, medicines and other inputs during crisis situations (51.10), indicating the vulnerability of dairy enterprises to fluctuations in input markets. The non-availability of affordable green fodder throughout the year ranked third with 43.19, highlighting the continued challenge of fodder scarcity in dairy production systems. Difficulty in obtaining profitable price for milk or dairy products ranked fourth with 40.18, suggesting the challenges in maintaining their own customer base of women entrepreneurs, which further escalates the price realization and market competitiveness. Paucity of time to cope-up dual responsibilities was ranked fifth with 30.50 mean Garrett score. Similar findings have been reported by (6), who identified from their study that fodder shortage, high feed cost and low milk price as major constraints among dairy farmers in Karnataka. Also, (7) reported that women engaged in dairy activities experienced workload and resource-related constraints. The findings indicate that economic, production and market-related constraints continue to dominate the entrepreneurial ecosystem of women dairy entrepreneurs and require integrated policy and institutional support.

Table 3: Overall Garrett ranking of major constraints

Overall rank	Constraint category	Constraint statement	Applicable N	Ranked N	Mean Garrett score	Severity index
1	Production	High cost of feed, fodder, medicines, and other dairy inputs	86	80	60.13	93.49
2	Shock and crisis	Increase in the price of feed, fodder, medicines, and other inputs during crisis situations	108	84	51.10	89.63
3	Production	Non-availability of affordable green fodder throughout the year	86	67	43.19	87.67
4	Marketing	Difficulty in getting profitable price for milk or dairy products	108	77	40.18	89.07
5	Socio-cultural	Time constraint due to multiple household and enterprise responsibilities	108	62	30.50	85.74
6	Processing	High cost of processing equipment	77	39	24.14	83.64
7	Procurement	High transportation cost in milk procurement	22	10	22.45	80.00
8	Shock and crisis	Price fluctuation of milk and dairy products during crisis situations	108	40	18.68	82.22
9	Financial	Limited access to credit from formal financial institutions	108	38	18.31	83.15
10	Financial	Requirement of collateral or guarantor for obtaining loans	108	38	16.76	82.41
11	Shock and crisis	Difficulty in procuring dairy inputs during crisis situations	108	33	15.60	81.85
12	Human capital	High cost of labour	108	37	15.35	83.33
13	Processing	Difficulty in maintaining quality and shelf-life of processed dairy products	77	19	13.49	80.52
14	Production	Delayed access to veterinary and artificial insemination services	86	21	12.43	81.16
15	Human capital	Non-availability of reliable and skilled labour for routine dairy enterprise activities	108	26	10.95	79.26

Activity-wise major constraints

The activity-wise Garrett ranking indicated that the nature and intensity of constraints differed according to dairy enterprise activity (Table 4). In case of respondents engaged only in production and marketing activities, increase in the price of feed, fodder, medicines and other inputs during crisis situations like drought or fodder shortage, animal disease outbreak, pandemic-like situations, were ranked first, followed by high cost of feed, fodder, medicines and other dairy inputs and the non-availability of affordable green fodder throughout the year.

Among the respondents who were involved in production, processing and marketing, high cost of feed, fodder, medicines and other dairy inputs ranked first, followed by crisis-related input price increase and non-availability of affordable green fodder. Among the respondents involved in procurement, processing and marketing activities and as well as the respondents who were into procurement and marketing activities, crisis-related increase in input price ranked first, followed by time constraint and difficulty in gaining profitable price.

Table 4: Activity-wise major constraints based on Garrett ranking

Entrepreneurial activity	No. of respondents	Major constraint 1	Major constraint 2	Major constraint 3
Production + Marketing	26	Increase in input prices during crisis situations (59.00)	High cost of feed, fodder, medicines and other inputs (58.69)	Non-availability of affordable green fodder (47.62)
Production + Processing + Marketing	60	High cost of feed, fodder, medicines and other inputs (60.75)	Increase in input prices during crisis situations (45.97)	Non-availability of affordable green fodder (41.27)
Procurement + Processing + Marketing	17	Increase in input prices during crisis situations (54.00)	Time constraint due to household and enterprise responsibilities (48.12)	Difficulty in getting profitable price (41.88)
Procurement + Marketing	5	Increase in input prices during crisis situations (61.80)	Time constraint due to household and enterprise responsibilities (56.40)	Difficulty in getting profitable price (53.20)

Discussion

The findings indicate that women dairy entrepreneurs face multi-dimensional constraints in the dairy entrepreneurial ecosystem. The most serious constraints were not limited to one focus area, but were spread across production, finance, labour, marketing, processing, procurement, crisis management, and socio-cultural responsibilities.

The highest category-wise severity index was observed for shock and crisis-related constraints. This infers that crisis situations affected both production and marketing areas of operation in women dairy enterprises. During crisis situations, the price of feed, fodder, medicines and other inputs may increase, while customer demand and milk price may fluctuate. For dairy enterprises, this creates a difficult situation in operational profile of dairy enterprises as animals require daily feeding, health care and management even during low returns.

Production-related constraints ranked second at the category level. High cost of feed, fodder, medicines and other dairy inputs was the most prioritised constraint both in severity index and Garrett ranking. This connotes input cost as the most critical constraint affecting enterprise sustainability. Similar findings were reported among dairy farmers in Bengaluru North, where shortage of green fodder, high cost of cattle feed and high cost of veterinary medicines were important constraints (6). Feed and fodder planning is also considered important at the national level because livestock productivity depends on regular availability of balanced feed and fodder resources (5).

The non-availability of affordable green fodder throughout the year was another major constraint. This affects milk yield, animal health and production cost. Women entrepreneurs may be forced to purchase fodder or depend more on concentrate feed when green fodder is unavailable, which in turn escalates the daily expenditure and reduces net profit. Therefore, fodder development, fodder seed support, fodder banks and training on low-cost feed management are important for supporting women dairy entrepreneurs.

With regard to financial constraints, limited access to credit from formal financial institutions, collateral requirement and complicated loan procedures were expressed by the respondent entrepreneurs as important constraints. Independent women dairy entrepreneurs require finance for animal purchase, animal housing maintenance and improvement, procurement of processing equipment, expenses for transportation, packaging, working capital and product marketing. Although credit facilities are available for animal husbandry and dairying activities through institutional mechanisms, access at the field level may still

be difficult due to exhaustive documentation, collateral and procedural issues as expressed by the women dairy entrepreneurs (1).

Marketing constraints require special attention in the present research study as the respondents were not into disposal of milk to dairy cooperatives. The entrepreneurs had their own customer base and were involved in direct sale of milk and dairy products. Difficulty in getting profitable price recorded a high severity index and was also ranked fourth in Garrett ranking. This shows that direct marketing gives women entrepreneurs better opportunity, but it also increases market responsibility related challenges. They have to fix price, convince customers, maintain quality, manage delivery, process, collect payment, and compete with well-known brands and local sellers.

Delay in payment from customers or buyers was also an important marketing constraint. This is common in direct customer-based selling because some buyers may follow weekly or monthly payment practices. Such delay affects working capital to manage the recurring expenses for feed, labour, transport and packaging. Difficulty in identifying, attracting and retaining customers also shows requisite of marketing knowledge and customer relationship management. Studies on dairy product consumers have shown that price, brand image, packaging, availability and services influence customer satisfaction and purchase decisions (4). Hence, women dairy entrepreneurs need guidance and support in branding, packaging, quality assurance and customer communication.

Processing-related constraints were important among respondents involved in value addition. High cost of processing equipment ranked first in this category. Difficulty in maintaining quality and shelf-life of processed dairy products ranked second. This shows that value addition is not possible only through entrepreneurial interest. It requires essential logistic support viz., equipment, technical skill, hygiene, electricity, packaging, cooling facilities and market linkage. For small dairy women entrepreneurs, shared processing facilities, common packaging units and technical training could reduce the burden of individual investment.

Procurement-related constraints were applicable only to 22 respondents, but high transportation cost in milk procurement ranked seventh in overall Garrett ranking. This shows that a constraint may appear less important at total sample level, but may be very serious for the sub-group to which it applies. Milk procurement requires timely collection of raw milk and safe transport for processing. High transportation cost and poor chilling facilities may

surge spoilage risk and quality concerns.

With regard to another important component, the socio-cultural result, time constraint due to multiple household and enterprise responsibilities ranked fifth in Garrett ranking. This was the major gender-specific constraint in the study. Women dairy entrepreneurs were not only managing dairy enterprise activities, but also household responsibilities. Direct marketing, value addition, packaging, and delivery further increase their time burden. Previous research on women dairy cooperative members in Karnataka also reported household workload, lack of family support, and socio-cultural restrictions as constraints faced by women (7).

The managerial constraints were ranked lower compared to production and financial constraints, but they are still important for enterprise development. Limited business management skills, difficulty in risk planning and in maintaining records were reported by the respondents. Since these women were selling through their own customer base, they need business skills such as cost calculation, pricing, customer management, record keeping and enterprise planning. Without these skills, they may continue to work hard but may not realise the actual profitability of their enterprise.

Overall, the results indicate that women dairy entrepreneurs require an ecosystem-based support approach. Besides feed and fodder support, credit access, management of animal healthcare, essential mechanization for processing equipment, packaging, marketing, need-based training, customer management, veterinary services, transportation, labour-saving and time-saving techniques need to be available. Since the respondents were independent direct-market entrepreneurs, support systems should move beyond the traditional production-focused approach and include entrepreneurial marketing support.

Conclusion

The study revealed that women dairy entrepreneurs in Karnataka operate within a challenging entrepreneurial ecosystem where production, marketing, finance, labour and household responsibilities are closely interlinked. The most critical constraints were high cost of feed, fodder, veterinary medicines, and other dairy inputs, spike in input prices during crisis situations, non-availability of affordable green fodder, and difficulty in getting profitable price for milk and dairy products, and time constraint due to multiple responsibilities. These findings show that the sustainability of women-owned and managed dairy enterprises is affected not only by production-related constraints, but also by market uncertainty and gender-specific work burden.

The result shows that the respondents were not only milk producers, but independent women dairy entrepreneurs with their own customer base. Therefore, their constraints were related not only to production, but also to pricing, product quality, customer retention, direct marketing, packaging, payment collection, processing, and delivery. This highlights the need to view women dairy entrepreneurship as an enterprise activity, not only as a household-based dairy occupation.

Strengthening women dairy entrepreneurship therefore requires a comprehensive and women-sensitive support system. Interventions should focus on affordable feed and

fodder management, timely veterinary and breeding services, easier access to formal credit, improved processing facilities, better packaging and branding support, direct market linkage, digital marketing skills, and time-saving enterprise services. If these support mechanisms are made available at the local level, women dairy entrepreneurs can move from survival-oriented enterprise management to more resilient, profitable and growth-oriented dairy entrepreneurship.

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