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Assessment and prioritisation of information needs of dairy farmers in Pune and Satara districts of Maharashtra

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Abstract

Dairy farming constitutes a critical pillar of agricultural livelihoods across rural Maharashtra, yet persistent knowledge gaps in scientific management continue to constrain animal productivity and milk quality. The present study was undertaken to assess and prioritise the information needs of dairy farmers. An exploratory research design was adopted. Sixty dairy farmers—each maintaining a minimum of ten dairy animals were selected through purposive random sampling from Pune and Satara districts of Maharashtra, which rank among the state's foremost bovine-rearing zones. Data were collected through a structured interview schedule and analysed using various statistical tools. The majority of respondents were in the middle age group (58.33%), had higher secondary education (40.00%), and had a medium herd size (68.33%). About (76.67%) fell in the high-income category (above Rs. 4,92,577 per annum), and 70.00% had received no formal dairy farming training. Information needs were assessed across four practice domains. Health care practices emerged as the highest-priority need domain with 41.67% of respondents categorising it as 'Most Needed'. Feeding practices ranked second, followed by management practices and breeding practices. WhatsApp and YouTube were utilised by all respondents (100%), underscoring the viability of digital video-based extension delivery. The present study identifies the key information needs of dairy farmers in the study area, which can be addressed through the development and dissemination of need-based ICT tools which are potential for enhancing farm-level productivity, animal welfare, and milk quality.

Keywords: Information needs, dairy farmers, ICT, health care

1. Introduction

India is the world's largest milk producer, with an annual output of 187.75 million tonnes and a per capita availability of 406 g per day, exceeding the recommendation of the Indian Council of Medical Research (Press Information Bureau, 2022) ^[10]. Dairy farming plays a vital role in rural livelihoods by providing regular income, employment, and nutritional security, particularly for small and marginal farmers. The sector contributes significantly to agricultural GDP, with a majority of rural households engaged in livestock-related activities. Maharashtra plays a vital role in India's dairy sector, housing 19.50 million bovines as per the 20th Livestock Census (2019) ^[2]. Pune and Satara are major dairy hubs, home to well-known companies like Warana Dairy and Chitale Dairy. Effective transfer of technology depends on the timely dissemination of scientific information from research systems to farmers, along with feedback from the field to researchers. In this context, Information and Communication Technologies (ICTs) have

emerged as powerful tools for strengthening linkages between research, extension, and farmers. ICT platforms such as YouTube and WhatsApp enable faster, wider, and more accessible communication, thereby enhancing farmers' ability to obtain relevant and need-based information. Information needs in dairy farming arise when farmers encounter situations where they lack sufficient knowledge to make informed decisions and seek support from external sources. Identifying the information needs is crucial for understanding field-level realities, as dairy farmers may not always recognise their own information gaps. It is widely acknowledged that successful dairy farming and rural development interventions—particularly those based on ICT—must be grounded in the actual needs of the dairy farming community. Despite the growing importance of ICTs, there is limited empirical evidence on how dairy farmers seek, access, and utilise information in key dairy regions. Therefore, the present study was undertaken to analyse the information-seeking behaviour of

dairy farmers and to assess and prioritise their information needs, with a view to supporting the development of effective, need-based ICT interventions.

2. Materials and Methods

An exploratory research design was adopted for the present investigation. The study was conducted in Pune and Satara districts of Maharashtra, India, purposively selected on the basis of their prominence as major dairy-producing zones in the state. A purposive random sampling technique was used to choose 60 dairy farmers from the Pune and Satara districts, with 30 selected from each district. This selection was based on an established eligibility criterion: a minimum herd size of 10 dairy animals to evaluate dairy farmers' information needs. These criteria ensured that the study population was sufficiently engaged in substantive dairy production and had the digital literacy required to subsequently utilise video-based extension content. Primary data were collected through a structured interview schedule developed specifically for the study. The schedule comprised two broad sections: (i) socio-economic and communication profile variables and (ii) information needs of dairy farmers assessed across four practice domains: breeding, feeding, management, and health care. Information needs for each domain were rated by respondents as: 'Most Needed', 'Needed', and 'Least Needed'. The interview was conducted through a personal contact method. The collected data were scored, tabulated, and analysed using statistical tools.

3. Results and Discussion

3.1 Socio-economic and Communication Profile of Respondents

The results of the current study are presented under the following headings

3.1.1 Age

Respondents were categorised into three age groups: young, middle, and old. Table 1 revealed that over half the respondents (58.33%) belonged to the middle age group (31–46 years), followed by the old age group (21.67%) and the young age group (20.00%), with a mean age of 39.71 years. Middle-aged farmers are generally more receptive to technical innovations, possess sufficient physical and financial capacity to invest in improved practices, and are actively motivated by the commercial prospects of the dairy industry. The increasing involvement of younger, educated individuals in dairy ventures, driven by strong demand for dairy products, indicates a positive outlook for future technology adoption in the sector.

3.1.2 Gender

Table 1 shows the gender data; a significant majority of respondents were male (93.33%), with women constituting only 6.67% of the sample population. This pattern shows that male predominance in dairy farm ownership and market-related decision-making, while women contributed substantially to daily operational tasks such as feeding, milking, and animal care. The under-representation of women underscores the importance of designing extension programmes that explicitly target women dairy workers.

3.1.3 Education

The educational backgrounds of dairy farmers are displayed in Table 1. The analysis of the respondents' education indicated that the highest percentage had completed higher secondary education (40.00%), followed by secondary education (23.33%), graduation (18.33%), primary education (11.67%), and those who were illiterate (6.67%). A deliberate focus on education might have been one factor encouraging continued schooling beyond the primary level. Additionally, the social environment in which they live could have influenced their motivation to seek higher education.

3.1.4 Occupation

Table 1 indicated that agriculture was the primary occupation of 70.00% of respondents, with dairy farming constituting the main occupation for 30.00%. As subsidiary occupations, goat, sheep, or pig farming (8.33%), self-employment (8.33%), service (3.33%), and poultry farming (1.67%) were also reported. Results indicated that most respondents, including those in agriculture, opted for dairy farming due to its enormous potential to generate revenue and employment. A portion of the participants were engaged in farming poultry, goat, sheep and pig farming, while others worked for themselves or as service members as a secondary source of income.

3.1.5 Family Type and Size

The majority of respondents (61.67%) belonged to nuclear families, while joint families constituted 38.33%. With respect to family size, 55.00% had medium-sized families (5–7 members), followed by large families (26.66%) and small families (18.34%).

3.1.6 Gross income from dairy farming

Table 1 depicted that notably, 76.67% of respondents fell in the high annual income category (above Rs. 4,92,577), while 23.33% belonged to the medium income category (Rs. 2,25,423–4,92,577), and none were in the low-income group (up to Rs. 225,423). This profile of high income probably represents the intentional choice of a minimum herd size of 10 animals, aligning with a semi-commercial production level. Dairy farming played a vital role in generating revenue, accumulating assets, and improving household nutrition in the study area, along with agriculture. It offers significant employment opportunities with relatively low initial investment, supported by easy access to loans from government and non-government institutions. As a result, it has become an important livelihood for all participants.

3.1.7 Land Holding

Table 1 indicates that the highest proportion of respondents possessed small-sized landholdings (33.34%), followed by semi-medium (25.00%), marginal (18.33%), medium (13.33%), landless (5.00%), and large holdings (5.00%). The reduction in land ownership can be linked to various initiatives in both the industrial and private sectors, as well as changes in family structures and the subdivision of land over generations.

3.1.8 Herd Size

Regarding herd size, the majority (68.33%) maintained

medium herds (10–50 animals), followed by small herds (21.67%) and large herds (10.00%). Medium herd holders show stronger information-seeking behaviour due to their economic motivation and resource capacity for adopting improved technologies. Small herd sizes indicate limited capital and risk capacity, with expansion often hindered by feed availability, finance, and infrastructure issues.

3.1.9 Experience in dairy farming

Most respondents (71.66%) had a medium level of dairy farming experience (5–9 years), followed by high experience (16.67%) and low experience (11.67%). This profile suggests familiarity with traditional practices, while indicating potential receptivity to scientific upgradation. This medium experience level presents an opportunity for extension services, as these farmers are receptive to need-based training and practical learning materials.

3.1.10 Training

Despite the experience, a large proportion of respondents (70.00%) had not received formal dairy farming training, which may be due to lack of time, low awareness of available facilities, and inadequate extension contact. This training gap represents a critical opportunity for ICT-based educational interventions. A lack of training and exposure hinders the adoption of scientific dairy practices, highlighting the need for enhanced capacity-building programs to improve productivity and management

efficiency.

3.1.11 Social Participation

With respect to social participation, 48.33% of respondents exhibited medium levels of organisational engagement, followed by high (28.33%) and low (23.33%) levels. Most respondents were members of milk cooperatives, Panchayat Samitees, or Gram Panchayats. Limited social engagement may restrict access to institutional information and collective marketing benefits, underlining the role of digital platforms in democratising knowledge access.

3.1.12 Mass Media Utilisation

Among mass media sources (Table 2), all respondents (100%) utilised WhatsApp and YouTube for information, with neighbourhood contacts, relatives, LDO, and LSS channels also achieving universal adoption (100%). Veterinary/Agriculture Extension Officers (90.00%), Krishi Vigyan Kendras (88.34%), and Kisan Call Centres (85.00%) were other widely used sources. Within group contact methods, seminars and melas were utilised by 98.34% of respondents. Television reached 98.34% of respondents, while radio was utilised by only 23.34%. The unanimous adoption of YouTube and WhatsApp for information seeking among this cohort is a particularly significant finding, as it validates the strategic deployment of video-based digital extension as the primary ICT modality for this population.

Table 1: Socio-economic and communication profile of dairy farmer respondents (N = 60)

Characteristic	Category	Frequency (n)	Percentage (%)
Age (years)	Young (up to 30 years)	12	20.00
	Middle (31–46 years)	35	58.33
	Old (above 47 years)	13	21.67
	Total	60	100.00
	Mean = 39.71; SD = 8.55		
Gender	Male	56	93.33
	Female	04	06.67
	Total	60	100.00
Education	Illiterate	04	6.67
	Primary (up to 4th)	07	11.67
	Secondary (5th–10th)	14	23.33
	Higher Secondary (11th–12th)	24	40.00
	Graduation (above 12th)	11	18.33
	Total	60	100.00
Occupation (Main)	Agriculture	42	70.00
	Dairy farming	18	30.00
Family type	Nuclear family	37	61.67
	Joint family	23	38.33
	Total	60	100.00
Family size	Small (up to 4 members)	11	18.34
	Medium (5–7 members)	33	55.00
	Large (above 7 members)	16	26.66
	Total	60	100.00
	Mean = 5.47; SD = 1.25		
Annual income (Rs.)	Low (up to Rs. 2,25,423)	00	00.00
	Medium (Rs. 2,25,423 – 4,92,577)	14	23.33
	High (above Rs. 4,92,577)	46	76.67
	Total	60	100.00
	Mean = Rs. 3,59,000; SD = Rs. 1,33,577		
Land holding	Landless (0 ha)	03	05.00
	Marginal (< 1 ha)	11	18.33
	Small (1–2 ha)	20	33.34
	Semi-medium (2–4 ha)	15	25.00

	Medium (4–10 ha)	08	13.33
	Large (> 10 ha)	03	05.00
	Total	60	100.00
Herd size	Small (up to 10 animals)	13	21.67
	Medium (10–50 animals)	41	68.33
	Large (above 50 animals)	06	10.00
	Total	60	100.00
Dairy Farming Experience	Low (< 5 years)	07	11.67
	Medium (5–9 years)	43	71.66
	High ($\geq$ 9 years)	10	16.67
	Total	60	100.00
	Mean = 6.72 years; SD = 2.05		
Formal training received	Yes	18	30.00
	No	42	70.00
	Total	60	100.00
Social participation	Low (up to 1 score)	14	23.33
	Medium (1–2 score)	29	48.33
	High (above 3 score)	17	28.33
	Total	60	100.00
	Mean = 1.90; SD = 0.72		

Table 2: Distribution of respondents according to mass media contact

Sr. No.	Category	Frequency	Percentage
A.	Personal Contact		
1.	Friends	58	96.67
2.	Neighbourhood	60	100
3.	Relatives	60	100
4.	Progressive Farmers	32	53.34
5.	Veterinary /Agriculture Extension Officer	54	90.00
6.	LDO	60	100
7.	LSS	60	100
8.	Scientist	17	28.34
9.	Kisan Call Centre	51	85
10.	Krishi Vigyan Kendra	53	88.34
B.	Group Contact		
1.	Meeting	28	46.67
2.	Tour	25	41.67
3.	Seminar/Melava	59	98.34
4.	Training programme	18	30.00
C.	Mass Contact		
1.	Radio	14	23.34
2.	Television	59	98.34
3.	Magazine	18	30
4.	Newspaper	24	40
5.	Exhibition	54	90
D.	Social media		
1.	Whatsapp	60	100.00
2.	YOUTUBE	60	100.00
3.	Facebook	15	25.00
4.	PODCAST	01	1.67
5.	Twitter	00	0
6.	Other	95	8.34

3.2 Information Needs of Dairy Farmers: Domain-wise Analysis and Prioritisation

After structured personal interviews, the information needs of all 60 respondents were assessed and classified across

four dairy management domains using a three-point scale ('Least Needed', 'Needed', 'Most Needed'). The domain-wise distribution is presented in Table 3.

Table 3: Distribution of respondents according to information needs in dairy farming practice domains(N = 60)

Dairy farming practice domain	Least Needed		Needed		Most Needed		Ranking
	Freq.	%	Freq.	%	Freq.	%	
Breeding practices	35	58.33	16	26.67	09	15.00	IV
Feeding practices	03	05.00	42	70.00	15	25.00	II
Management practices	27	45.00	22	36.67	11	18.33	III
Health care practices	01	01.67	34	56.66	25	41.67	I

3.2.1 Breeding Practices

Breeding practices received 58.33% of respondents categorising it as 'Least Needed', 26.67% as 'Needed', and 15.00% as 'Most Needed'. Singh *et al.* (2016) [15] similarly found breeding practices to be a lower-priority information category relative to feeding and health care. The relatively lower felt need for breeding information may reflect the widespread availability and functional expansion of Government AI services in Pune and Satara districts, reducing farmers' perceived need for additional breeding knowledge. Additionally, many respondents may rely on traditional natural service practices and perceive this as adequate, potentially underestimating the reproductive efficiency gains achievable through scientific breeding management.

3.2.2 Feeding Practices

Feeding practices ranked overall with 70.00% of respondents categorising it as 'Needed' and 25.00% as 'Most Needed'. Only 5.00% rated it 'Least Needed'. This high demand for feeding information is identified as among the most pressing information needs of dairy farmers. Balanced ration formulation integrating green fodder, crop residues, concentrates, and mineral supplements is critical for sustaining optimal milk yield and reproductive performance, yet remains poorly practised by smallholder farmers who predominantly rely on traditional, non-scientific feeding regimens.

3.2.3 Management Practices

Management practices with 45.00% of respondents rating it 'Least Needed', 36.67% as 'Needed', and 18.33% as 'Most Needed'. This pattern aligns with Kumar *et al.* (2020) [5], who reported approximately 40.00% of respondents as having low perceived information needs for general management, followed by 38.30% with high and 21.70% with medium needs. The moderate overall ranking of management practices does not diminish their extension importance; rather, it may reflect a degree of experiential familiarity with routine management tasks such as housing maintenance and watering schedules acquired through years of practical engagement. However, scientific aspects of management, such as record-keeping, production monitoring, and waste management remain underexplored and merit targeted extension content.

3.2.4 Health Care Practices

Health care practices emerged as the highest-priority information need domain, with 41.67% of respondents categorising it as 'Most Needed' and 56.66% as 'Needed'. Only 1.67% considered it 'Least Needed', indicating near-universal recognition of health care as a critical information gap. The preeminence of health care information needs in this study is likely attributable to the high financial stakes of disease-related animal mortality and production losses in semi-commercial herds. Diseases such as Foot-and-Mouth Disease (FMD), Brucellosis, Hemorrhagic Septicaemia, and mastitis are widely prevalent in Maharashtra's dairy sector (DAHD, 2022) [3], and their prevention, early detection, and management represent critical knowledge gaps. For the medium-herd farmers predominating in this study, even a single disease outbreak can eliminate an entire year's profit

margin, creating a strong felt need for preventive veterinary knowledge.

4. Conclusion

The present study provides an empirical assessment of the information needs of dairy farmers, revealing health care practices as the highest priority (Rank I), followed by feeding (Rank II), management (Rank III), and breeding (Rank IV). The respondents were predominantly middle-aged, moderately educated, and semi-commercial farmers with relatively high income but limited formal training, indicating a gap between economic status and technical knowledge. The universal use of WhatsApp and YouTube highlights the strong potential of utilization of ICT-based extension tools. The benefit of an ICT-based extension system is to share information or knowledge, to access information swiftly, and to promote better farming. The present study identifies the key information needs of dairy farmers in the study area, which can be addressed through the development and dissemination of need-based ICT tools which are potential for enhancing farm-level productivity, animal welfare, and milk quality.

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