



Strengthening Rural Dairy Value Chains through Capacity Building, Women-Led Livestock Services and Organized Milk Marketing: A Pilot Initiative in Raisen, Madhya Pradesh

Maria Khan^{1,2}, Arvind Singh Yadav^{1,2}, Mumsar Raja² and Asad Khan³

¹Madhya Pradesh State Rural Livelihood Mission (MPSRLM), Raisen–464551, Madhya Pradesh

²Bharat Financial Inclusion Limited CSR Project (BFIL–CSR), Raisen – 464551, Madhya Pradesh

³ICAR – National Dairy Research Institute, Karnal – 132001, Haryana

* Corresponding author. E-mail: asadjouravi@gmail.com

<https://doi.org/10.48165/jes.2026.42.01.04>

ARTICLE INFO

Article history

Received: 09.07.2026

Revised: 29.07.2026

Accepted: 27.08.2026

Keywords

Dairy Value Chain

Livelihood

Milk Pooling Point

Pashu Sakhi

Women-led dairy development

ABSTRACT

This case study documents an implemented pilot initiative of the Madhya Pradesh State Rural Livelihoods Mission (MPSRLM) in Sanchi Block of Raisen District, Madhya Pradesh, covering Jamuniya, Ninod and Kayampur villages. A baseline assessment identified a substantial milk production base together with low price realization, dependence on private vendors, weak market connectivity, limited livestock services and inadequate collection infrastructure. The intervention subsequently integrated community-level capacity building, training and deployment of local women as Pashu Sakhis, scientific livestock-management programmes, institutional linkage with Bhagyauday Mahila Kisaan Producer Company Limited, and establishment of a Milk Pooling Point (MPP). By the end of 2025, organized milk procurement had been operationalized through the MPP and the procurement price available to participating producers had increased from approximately ₹39/L under the earlier vendor-based system to ₹55/L, representing a 41.03% improvement in price realization per litre. The initiative demonstrates how women-led institutions, decentralized livestock services, producer-oriented market linkages and village-level milk aggregation can be combined to strengthen rural dairy value chains. The next infrastructure phase envisages installation of a Bulk Milk Cooler (BMC) to support timely chilling, milk-quality preservation and expansion of organized procurement. As a descriptive implementation case study without a control group, the study documents achieved institutional and marketing outcomes while recognizing the need for longer-term monitoring of household income, milk quality and livelihood effects.

INTRODUCTION

India is the world's largest milk producer, with national milk production estimated at 239.30 million tonnes in 2023–24 and per-capita availability at 471 g/day (BAHS, 2024). Dairying is especially important for smallholders because it generates frequent cash income, supports household nutrition and employment, and can

diversify livelihood risk (FAO, 2026a). Yet the benefits of dairy growth are not distributed automatically. Small-scale producers commonly face weak access to animal-health services, training, quality inputs, capital and reliable markets, and the efficiency of the value chain strongly influences farm-level profitability (FAO, 2026b). These constraints make institutional arrangements that connect production, services, aggregation and marketing central to inclusive dairy development.

A dairy value chain comprises the linked activi-

ties and actors involved in input supply, milk production, collection, chilling, processing, transport, marketing and distribution. Evidence from organized dairy systems in India indicates that stronger coordination among chain actors and producer-oriented institutions can improve marketing efficiency and the producer's share in the consumer price (Mohapatra et al., 2022; Vanishree et al., 2018). Capacity building is an equally important component: trained dairy farmers have been reported to show higher knowledge, adoption of scientific practices and income than comparable untrained farmers (Khode et al., 2021). Women are particularly important to dairy production and animal care, and women-led dairy institutions can strengthen technical participation, control over milk income and decision-making (Farnworth et al., 2023). Thus, value-chain strengthening is most likely to be effective when market access is combined with technical services, local human-resource development and meaningful participation of women.

Madhya Pradesh is a major contributor to India's dairy economy, accounting for 8.91% of national milk production in 2023–24 (BAHS, 2024). Previous field studies in Madhya Pradesh have demonstrated that livestock rearing remains closely associated with the livelihoods of small and resource-constrained rural households. Surveys conducted in the Mahakaushal region reported generally poor socio-economic conditions among cattle- and buffalo-rearing farmers, with livestock production largely dependent on traditional management systems, pasture grazing and low-cost housing (Sharma et al., 2021; Vandre et al., 2021). More recently, a district-wide assessment in Raisen also revealed the predominance of traditional livestock husbandry, small landholdings, relatively low household incomes and substantial participation of both men and women in livestock management (Khan et al., 2025). These observations emphasize the importance of interventions that integrate improved animal husbandry with capacity building, accessible livestock services and stronger market linkages. Evidence from Jabalpur district of Madhya Pradesh likewise identifies non-remunerative milk prices, seasonal fodder shortages, inadequate finance, milk-storage problems, and limited access to breeding and veterinary services as important constraints (Meenia et al., 2022). Against this background, MPSRLM implemented a pilot intervention in Sanchi Block of Raisen District covering Jamuniya, Ninod and Kayampur (Fig. 1). The initiative combined baseline assessment, community mobilization, Pashu Sakhi training, scientific animal-husbandry training, linkage with a women-led producer company

and establishment of organized village-level milk collection. The present case study documents the implementation and outcomes of this integrated approach, including improved milk-price realization and operationalization of the Milk Pooling Point, while outlining BMC installation as the next phase of infrastructure development.

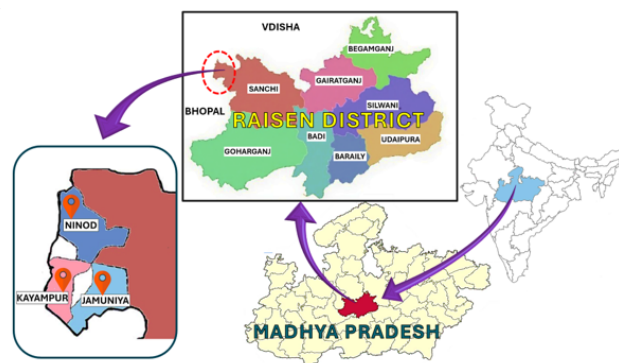


Figure 1: Targeted villages – Jamuniya, Ninod and Kayampur in Sanchi Block of Raisen District of Madhya Pradesh State

MATERIALS AND METHODS

The study used a descriptive case-study design to document the implementation of a dairy value-chain intervention in Jamuniya, Ninod and Kayampur villages of Sanchi Block, Raisen District, Madhya Pradesh. Between May and September 2025, a baseline assessment evaluated key village metrics, including household demographics, human and livestock populations, and daily milk production. It also mapped out procurement channels, pricing, market access, and available veterinary and extension services. Information was obtained through household interactions, field observations, discussions with livestock owners and village-level milk-production recording. A participatory needs assessment was then used to identify constraints related to milk marketing, transportation, animal health-care, feeding and awareness of scientific husbandry practices. Intervention activities and implementation milestones were subsequently documented up to the end of 2025. The study was designed as implementation documentation rather than a randomized or controlled impact evaluation.

Based on the needs assessment, capacity-building activities were organized within the National Rural Livelihoods Mission framework. Local women were identified and trained as Pashu Sakhis to serve as community-level livestock resource persons. Training covered vaccination and deworming support, disease prevention,

feeding, housing and basic livestock advisory services. This decentralized service model is consistent with the broader Pashu Sakhi approach, in which trained rural women complement formal veterinary systems by providing preventive and primary animal-health support at community level (Kumar et al., 2026). “Unnat Pashu Palan Prashikshan” programmes further addressed balanced feeding, fodder management, mineral supplementation and low-cost scientific livestock management.

Institutional linkage was established with Bhagyau-day Mahila Kisaan Producer Company Limited to organize milk aggregation and marketing. Following community mobilization and coordination with the producer company, a Milk Pooling Point (MPP) was established and organized milk procurement was operationalized in the intervention area by December 2025. The procurement price available through the organized channel reached ₹55/L, compared with approximately ₹39/L received from local private vendors at baseline. Price improvement was expressed as $[(₹55 - ₹39) / ₹39] \times 100$, corresponding to a 41.03% increase in price realization per litre. For contextual comparison, the gross value of the baseline recorded milk volume at the two price levels was calculated as milk volume $\times$ procurement price. These calculations illustrate the monetary implication of the achieved price differential for an unchanged milk volume; they are not estimates of net household income because milk quality, actual litres sold by individual households, transport and transaction costs, producer-company deductions and other operating factors were not incorporated. Installation of a Bulk Milk Cooler (BMC) remains the planned next phase of infrastructure development under MPSRLM.

RESULTS AND DISCUSSION

The baseline assessment conducted in Jamuniya, Ninod and Kayampur villages revealed a considerable milk production base but also identified important constraints affecting the efficiency and profitability of dairy-based livelihoods. Daily milk production was approximately 550 L in Jamuniya, 360 L in Ninod and 150 L in Kayampur, representing a combined recorded milk volume of about 1,060 L/day. Jamuniya had the highest livestock population (788 cattle and buffaloes) and milk availability, followed by Ninod (514 animals) and Kayampur (215 animals). Milk production per household was also highest in Jamuniya (1.93 L/day), followed by Ninod (1.71 L/day) and Kayampur (0.85 L/day) (Table 1). At baseline, farmers were largely dependent on private milk vendors and faced low price realiza-

tion, inadequate transportation, weak market connectivity and the absence of an organized village-level milk procurement system. These constraints formed the basis for the subsequent intervention, which established community livestock-support mechanisms and an organized milk-marketing channel.

The constraints observed in the study villages appear to reflect broader limitations of livestock production systems previously documented in Madhya Pradesh. Studies conducted in the Mahakaushal region reported relatively poor socio-economic conditions among cattle- and buffalo-rearing households, together with dependence on traditional management systems, grazing and low-cost animal housing (Sharma et al., 2021; Vandre et al., 2021). More importantly, a district-level assessment in Raisen reported small landholdings, relatively low household incomes, traditional livestock-management practices, inadequate housing and drainage, limited fodder cultivation, and gaps in vaccination, deworming and veterinary-service coverage (Khan et al., 2025). Similarly, non-remunerative milk prices and deficiencies in dairy marketing and service delivery have been reported as important constraints among dairy farmers elsewhere in Madhya Pradesh (Meenia et al., 2022; Somtiya et al., 2024). The findings of the present study therefore suggest that strengthening dairy livelihoods in such areas requires simultaneous improvement in production practices, livestock services and market access rather than interventions focusing exclusively on increasing milk production.

CAPACITY BUILDING AND COMMUNITY-BASED LIVESTOCK SERVICES

An important component of the intervention was strengthening human resources at the village level through the identification and training of local women as Pashu Sakhis, along with livestock health camps and farmer-oriented capacity-building programmes (Fig. 2). These community-level livestock resource persons facilitated vaccination and deworming activities, promoted awareness regarding disease prevention and improved animal housing, and provided basic livestock-management advice and linkage with veterinary services. This approach was particularly relevant considering the gaps in veterinary coverage and scientific livestock management previously reported in Raisen district (Khan et al., 2025). Community-based livestock workers can complement formal veterinary services by improving last-mile access to preventive animal health-care, particularly in villages where regular access to vet-

Table 1: Baseline socio-economic and livestock profile and price implications of the organized milk procurement intervention in the study villages

Parameter	Jamuniya	Ninod	Kayampur
Households (No.)	285	211	176
Population (No.)	1,762	1,512	1,241
Cattle + buffalo population (No.)	788	514	215
Milk production (L/day)	550	360	150
Milk production/household (L/day)	1.93	1.71	0.85
Animals/household (No.)	2.8	2.4	1.2
Baseline vendor price (₹/L)	39.00	39.00	39.00
Gross value of recorded milk volume at baseline price (₹/day)	21,450	14,040	5,850
Organized procurement price achieved by Dec. 2025 (₹/L)	55.00	55.00	55.00
Gross value of same recorded milk volume at organized price (₹/day)	30,250	19,800	8,250
Difference in gross value for same recorded volume (₹/day)	8,800	5,760	2,400
Increase in procurement price / gross value for same volume (%)	41.03	41.03	41.03

erinarrians is limited (Kumar et al., 2026).



Figure 2: Major field interventions undertaken under the pilot initiative, including baseline assessment, Pashu Sakhi training, livestock health camps, farmer capacity building and Unnat Pashu Palan Prashikshan

Capacity building was further strengthened through Unnat Pashu Palan Prashikshan, which focused on balanced feeding, fodder management, mineral supplementation, vaccination, deworming, disease prevention, housing and low-cost livestock-management strategies using locally available resources. Farmers were also sensitized about government-supported livestock development schemes. Such interventions are important because training does not merely increase awareness but can facilitate the adoption of recommended dairy-management practices. Previous studies have reported positive effects of structured dairy training on farmers' knowledge and adoption of scientific livestock-management practices (Chander & Chand, 2022; Khode et al., 2021).

The involvement of women as Pashu Sakhis also added an important social dimension to the intervention. Women undertake a substantial proportion of routine dairy-management activities, including feeding, milking, cleaning, and animal care, but their participation in formal livestock services and marketing institutions is often comparatively limited. Women-led dairy institutions have been associated with greater technical participation, control over milk income and involvement in household decision-making (Farnworth et al., 2023). The integration of Pashu Sakhis with a women-led producer organization in the present initiative therefore provides scope for women to participate not only as livestock keepers but also as community service providers and actors within the dairy value chain.

ORGANIZED MILK PROCUREMENT AND IMPROVED PRICE REALIZATION

At baseline, farmers in all three villages were receiving approximately ₹39/L from local private milk vendors. To address low price realization, fragmented marketing and dependence on dispersed private buyers, institutional linkage was established with Bhagyauday Mahila Kisaan Producer Company Limited. This linkage progressed from planning to implementation, and a Milk Pooling Point (MPP) was established for village-level aggregation and organized procurement. By December 2025, the organized procurement channel was functional and the procurement price available to participating milk producers had reached ₹55/L. Thus, the intervention achieved an increase of ₹16/L over the baseline vendor price, equivalent to a 41.03% improvement in price realization per litre.

Applying the achieved ₹55/L procurement price to the baseline recorded milk volumes illustrates the economic magnitude of this price improvement. For Jamuniya, the gross value of 550 L/day rises from ₹21,450 at ₹39/L to ₹30,250 at ₹55/L, a difference of ₹8,800/day for the same volume. Corresponding values are ₹14,040 and ₹19,800 in Ninod, a difference of ₹5,760/day, and ₹5,850 and ₹8,250 in Kayampur, a difference of ₹2,400/day. For the combined baseline volume of 1,060 L/day, the gross value at the two price levels is ₹41,340 and ₹58,300, respectively, a difference of ₹16,960/day. These figures quantify the value of the achieved ₹16/L price differential when applied to the recorded baseline volume; they should not be interpreted as measured changes in net household income unless the corresponding volumes were actually marketed through the MPP.

The transition from vendor-dependent marketing to an operational Milk Pooling Point represents an important institutional outcome of the initiative. Organized dairy value chains and producer-oriented institutions can improve producers' market participation and share in the value of milk by reducing marketing inefficiencies and strengthening collective bargaining and market linkages (Mohapatra et al., 2022; Vanishree et al., 2018). In the present case, the MPP functions not merely as a physical collection facility but as a village-level mechanism for milk aggregation, organized procurement and stronger linkage between producers and a women-led producer company. The increase from approximately ₹39/L to ₹55/L further demonstrates a tangible improvement in the marketing terms available to participating producers.

The 41.03% figure reported here refers specifically to the increase in procurement price per litre from the baseline vendor price of ₹39/L to the organized procurement price of ₹55/L. Although the same percentage applies to the gross value of an unchanged quantity of milk, it should not be presented as a measured 41.03% increase in net farmer income. Actual household benefits depend on the quantity marketed through the MPP, milk composition and quality, fat- and SNF-based pricing where applicable, transportation and transaction costs, producer-company deductions and changes in production over time. Continued monitoring is therefore required to quantify realized household-level income effects and the sustainability of the improved price realization.

INFRASTRUCTURE DEVELOPMENT AND SUSTAINABILITY

With the Milk Pooling Point established and organized procurement operationalized, the next infrastructure priority is installation of a Bulk Milk Cooler (BMC) under MPSRLM, Raisen. The BMC is intended to strengthen the functioning of the existing collection system by enabling prompt chilling of aggregated milk, preserving quality, reducing deterioration between milking and onward transport, and supporting access to larger or more distant organized markets. Prompt cooling is particularly important for maintaining the microbiological quality of raw milk during collection and transportation (Vekariya et al., 2023). Successful operation of the proposed BMC will require adequate and consistent milk throughput, reliable electricity, maintenance arrangements, milk-quality testing, transparent payment mechanisms, transportation logistics and stable market linkages.

Implementation also highlighted areas requiring continued strengthening, particularly transportation, financial and technical support, continuity of extension services and veterinary backstopping. Regular refresher training and supervision of Pashu Sakhis are important for maintaining the quality of community-level livestock services. Development of locally appropriate and climate-resilient fodder resources is likewise important for sustaining milk production during periods of seasonal feed scarcity. These continuing needs are consistent with previous studies from Madhya Pradesh that identified fodder availability, veterinary services, housing, finance and marketing as inter-related constraints to dairy development (Meenia et al., 2022; Somtiya et al., 2024). Unlike the MPP and organized procurement components, which had been implemented by December 2025, BMC installation remains the principal planned infrastructure expansion.

Overall, the major strength of the pilot initiative lies in the integration of multiple components within a single operational framework. Rather than treating low dairy income solely as a production problem, the intervention addressed technical knowledge through farmer training, last-mile livestock services through trained Pashu Sakhis, collective market access through a women-led producer company, and village-level aggregation through an established Milk Pooling Point. By December 2025, the intervention had moved beyond planning to operational implementation of these components, including improved procurement price realization. The proposed BMC represents the next step in consolidating the collection system through milk chill-

ing and quality preservation. This integrated approach is particularly relevant in light of earlier studies from the Mahakaushal region and Raisen district demonstrating that livestock-dependent households face multiple interconnected socio-economic, management and service-delivery constraints (Sharma et al., 2021; Vandre et al., 2021; Khan et al., 2025).

The findings should nevertheless be interpreted within the limitations of a descriptive pilot case study. The intervention did not include a control group or counterfactual, and systematic post-intervention measurements of milk yield, milk quality, disease incidence, adoption of recommended practices, household net income or women's empowerment were not available. Accordingly, the study can document implementation achievements—such as Pashu Sakhi capacity building, producer-company linkage, establishment of the MPP, operationalization of organized procurement and improvement in the procurement price—but cannot attribute broader livelihood changes solely to the intervention. Future monitoring should record actual litres procured through the MPP, producer participation and retention, fat- and SNF-based prices, transaction and transportation costs, milk rejection rates, utilization of Pashu Sakhi services, adoption of improved husbandry practices and women's control over dairy income. Such longitudinal evidence will allow more rigorous assessment of the economic sustainability and scalability of the model, while the planned BMC can be evaluated after installation for its contribution to milk quality, handling efficiency and market expansion.

CONCLUSION

The MPSRLM pilot in Sanchi Block demonstrates an implemented framework for integrating capacity building, women-centered community institutions, decentralized livestock support and organized milk marketing. The baseline identified a combined recorded milk volume of about 1,060 L/day together with substantial market and service constraints. In response, local women were trained as Pashu Sakhis, livestock keepers received scientific husbandry training, producers were linked with Bhagyauday Mahila Kisaan Producer Company Limited, and a Milk Pooling Point was established. By December 2025, organized milk procurement was operational and the procurement price available to participating producers had increased from approximately ₹39/L to ₹55/L, an improvement of ₹16/L or 41.03% in price realization. These achievements show that community capacity building, women-led livestock services and organized market linkage can

be translated into an operational village-level dairy value chain rather than remaining at the planning stage. Installation of a Bulk Milk Cooler is the next planned infrastructure phase and is expected to support timely chilling, milk-quality preservation and further strengthening of the organized procurement system. Longer-term monitoring remains necessary to quantify net household income effects, milk-quality outcomes, women's economic participation and the sustainability and scalability of the model.

REFERENCES

- BAHS. (2024). *Basic animal husbandry statistics*. Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India. <https://dahd.gov.in/sites/default/files/2024-11/BAHS-2024.pdf>
- Chander, R. K., & Chand, R. (2022). Adoption, learning and enhancement of knowledge of dairy farming practices: An impact assessment. *Journal of Krishi Vigyan*, 10(2), 6–11. <https://doi.org/10.5958/2349-4433.2022.00002.2>
- FAO. (2026a). *Dairy development: Gateway to dairy production and products*. Food and Agriculture Organization of the United Nations. <https://www.fao.org/dairy-production-products/socio-economics/dairy-development/en>
- FAO. (2026b). *Smallholders in the value chain: Gateway to dairy production and products*. Food and Agriculture Organization of the United Nations. <https://www.fao.org/dairy-production-products/socio-economics/smallholders-in-the-value-chain/en>
- Farnworth, C. R., Ravichandran, T., & Galiè, A. (2023). Empowering women across gender and caste in a women's dairy cooperative in India. *Frontiers in Sustainable Food Systems*, 7, 1123802. <http://doi.org/10.3389/fsufs.2023.1123802>
- Khan, M., Khan, A., Kumar, I., Vyas, J., & Khan, A. (2025). Assessment of livestock, poultry and fisheries distribution and management practices in Raisen district of Madhya Pradesh state. *Journal of Livestock Biodiversity*, 14(1), 52–61.
- Khode, N., Singh, B. P., Chander, M., Bardhan, D., Verma, M. R., & Awandkar, S. P. (2021). Effects of dairy farm training: A path analysis. *Indian Journal of Extension Education*, 57(4), 7–12.
- Kumar, T., Chander, M., Rawat, U., & Prabex, S. (2026). Pashusakhi model: A structural and functional perspective of community animal health workers in north-eastern part of Uttar Pradesh. *Journal of Agricultural Extension Management*, 26(2).
- Meenia, P., Naberia, S., Kethavath, N., & Bashir, M. (2022). Constraints perceived by dairy farmers in adoption of recommended dairy practices and suggestions to overcome constraints in Jabalpur district of Madhya Pradesh. *Indian Journal of Extension Education*, 58(3), 115–117.
- Mohapatra, S., Sendhil, R., & Pabba, A. S. (2022). Analysis of dairy value chains in organized sectors of Haryana: A chain wide learning approach. *Indian Journal of Extension Education*, 58(4), 96–101.
- Sharma, M., Thakur, M. S., Joshi, S., Tantia, M. S., Sharma, R., Singh, A. P., Pandey, A., Khare, V., Vandre, R. K., & Khan, A. (2021). Survey of socioeconomic status of farmers and distribution of cattle population in the Mahakaushal region of Madhya Pradesh. *The Pharma Innovation Journal*, 10(11S), 1051–1054.

- Singh, S., Singh, J., & Singh, P. (2017). A study on differential adoption and constraints of dairy farmers about scientific dairy farming practices in Amritsar district of Punjab. *Journal of Agricultural Extension Management*, 18(1).
- Somtiya, A., Naberia, S., Rajan, P., Shrivastava, A., & Singh, U. (2024). Perceived constraints and strategic recommendations by commercial dairy farmers in Jabalpur, Madhya Pradesh, India. *Asian Journal of Agricultural Extension, Economics & Sociology*, 42(6), 270–275. <https://doi.org/10.9734/ajaees/2024/v42i62489>
- Vandre, R. K., Joshi, S., Thakur, M. S., Tantia, M. S., Sharma, R., Singh, A. P., Pandey, A., Khare, V., Sharma, M., & Khan, A. (2021). Assessment of socio-economic status of farmers and distribution of buffalo population in the Mahakaushal region of Madhya Pradesh. *Journal of Animal Research*, 11(4), 711–716.
- Vanishree, M., Sendhil, R., Sirohi, S., Chauhan, A. K., Rashmi, H. M., & Ponnusamy, K. (2018). Role of dairy cooperatives in strengthening value chain of liquid milk and its sustainability in Karnataka: Findings from preliminary study. *Indian Journal of Economics and Development*, 14(1a), 410–415.
- Vekariya, Y., Patel, D. S., & Kathiriya, M. (2023). Improvement in quality of cow's raw milk by using novel on-farm milk cooling system. *Indian Journal of Dairy Science*, 76(4).