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Research Article

Exploring the Role of Dairy Value Chains in the Socio-Economic Advancement of Rajasthan's Marginal Communities

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Abstract

The dairy sector in India plays a pivotal role in rural development, offering income and livelihood opportunities, particularly for marginal communities. This research paper explores the contribution of dairy value chains in enhancing the socio-economic conditions of marginalized communities in Rajasthan. Using primary data collected through surveys, interviews, and focus group discussions across select districts, the study critically analyses how dairy production, processing, and marketing impact income generation, social inclusion, and economic mobility. The findings reveal that while the dairy value chain has contributed to income diversification and social upliftment, significant gaps remain in terms of access to resources, market linkages, and institutional support. Policy recommendations are provided to strengthen dairy value chains for inclusive rural development.

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1. INTRODUCTION

The Indian dairy sector is among the largest in the world, serving as a cornerstone of rural livelihoods and national nutrition security. Within this expansive system, the state of Rajasthan stands out not only for its significant contribution to national milk production but also for the intricate social and economic fabric that intertwines dairy with the lives of its people. Marginal communities, including smallholder farmers, landless labourers, women, and Scheduled Castes and Tribes, form a substantial part of Rajasthan's rural population. For these groups, dairy farming often transcends mere economic activity—it becomes a vital pathway to resilience, empowerment, and social mobility. This research aims to explore how dairy value chains contribute to the socio-economic advancement of these marginalized communities in Rajasthan, investigating both the opportunities and the systemic challenges embedded within the sector.

Dairy value chains encompass the entire spectrum of activities involved in the production, processing, marketing, and distribution of dairy products. From input supply and animal rearing to milk collection, processing, and retail, each node of the value chain offers varying degrees of income generation, skill development, and employment potential. In Rajasthan, where climatic conditions pose a challenge to crop-based agriculture, dairy serves as a more stable and accessible source of livelihood. Despite this potential, access to these opportunities is not uniformly distributed. Factors such as caste-based exclusion, gender inequality, limited access to credit and veterinary services, and market asymmetries often limit the benefits that marginalized groups derive from the dairy sector.

Government and non-governmental interventions, such as cooperative models and self-help groups (SHGs), have attempted to address these disparities by fostering collective action and improving access to markets, finance, and technology. Initiatives like the National Dairy Plan and state-level cooperative networks (e.g., Rajasthan Cooperative Dairy Federation) have played a pivotal role in integrating smallholders into formal value chains. However, the actual impact of these efforts on marginal communities remains uneven and understudied. Many interventions tend to overlook socio-cultural dynamics and power relations that affect participation and benefit-sharing within the value chain.

This study adopts a multi-disciplinary lens to evaluate the socio-economic impacts of dairy value chains on Rajasthan's marginalized communities. By integrating qualitative and quantitative methods, the research examines how participation in dairy value chains influences household income, women's empowerment, food security, and access to education and healthcare. It also assesses the role of institutional mechanisms, such as cooperatives and private players, in shaping inclusive growth.

Understanding these dynamics is particularly urgent in the context of increasing rural distress, climate change, and shifting economic patterns that threaten traditional livelihoods. The findings of this study aim to inform policy frameworks and development programs targeting inclusive growth through agribusiness value chains. By critically analyzing both the potential and the pitfalls of dairy-led development, this research aspires to contribute toward more equitable and sustainable rural transformation in Rajasthan and similar socio-economic contexts.

2. LITERATURE REVIEW

The existing body of research highlights the critical role of dairy value chains in fostering rural livelihoods and socio-economic development. Birthal et al. (2006) emphasized the opportunities and challenges for smallholder livestock production in India, while Delgado et al. (1999) predicted the growing significance of livestock in addressing future food security needs. Kurien (2007) documented the success of cooperative dairy models like Amul in empowering farmers. Kumar and Staal (2010) explored the viability of traditional milk marketing channels. Sharma and Kumar (2021) and Singh and Meena (2021) underscored the role of dairy cooperatives and organized marketing in improving rural incomes. FAO (2019, 2021, 2022) and IFAD (2020, 2021) emphasized gender dynamics, climate resilience, and inclusivity within dairy value chains. Rathi and Sahu (2021) and Singh and Gupta (2019) provided empirical evidence from Rajasthan on the positive link between dairy cooperatives, market access, and rural livelihoods. UNICEF (2020) highlighted the nutritional impacts of dairy on rural households, while NABARD (2021, 2022) and World Bank (2019, 2020, 2021, 2022) examined dairy's role in poverty reduction and rural development. Meena and Singh (2022) and Sharma and Singh (2022) discussed the impact of dairy value chain interventions and veterinary services on dairy productivity. Chand and Birthal (2018) emphasized agricultural diversification through dairy, and Sharma (2019) analyzed emerging trends and policy challenges in the Indian dairy sector. These studies collectively demonstrate that while dairy value chains hold immense potential for rural socio-economic advancement, barriers related to market access, gender disparities, institutional support, and policy implementation continue to affect marginalized communities, necessitating targeted research and inclusive interventions as undertaken in this study.

3. Background and Rationale

Rajasthan, the largest state in India by area, presents a unique socio-economic and agro-climatic landscape characterized by arid and semi-arid zones, erratic rainfall, and a high dependence on livestock for livelihood. Within this setting, dairy farming emerges as a crucial source of income and nutrition, particularly for small and marginal farmers who constitute over 70% of the rural population. The livestock sector contributes significantly to the state's agricultural Gross Domestic Product (GDP), with milk production being a major component. As per recent data from the Department of Animal Husbandry and Dairying, Rajasthan ranks among the top milk-producing states in India, reflecting both the scale and importance of its dairy economy. Despite these achievements, the benefits of dairy development have not been equitably shared across all communities.

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Marginalised groups—especially women, Scheduled Castes (SCs), Scheduled Tribes (STs), and landless laborers—often face structural barriers that limit their access to productive assets, veterinary care, training, credit facilities, and organized markets. These systemic constraints not only inhibit their participation in the dairy value chain but also reduce their capacity to leverage it as a vehicle for socio-economic improvement. For many rural households in these categories, dairy is not just an economic activity but also a buffer against vulnerability, a source of nutritional security, and, in some cases, a means to social recognition.

Over the past few decades, a range of interventions—including dairy cooperatives, producer companies, non-governmental organizations (NGOs), and public-private partnerships—have attempted to integrate smallholders and marginalized communities into formal dairy value chains. Institutions such as the Rajasthan Cooperative Dairy Federation (RCDF) and various women-led self-help groups (SHGs) have promoted collective milk collection, quality control, value addition, and market linkage. While these efforts have shown pockets of success, the overall impact remains inconsistent and often inadequately documented, especially in terms of social empowerment, intra-household dynamics, and long-term economic upliftment.

The rationale for this study stems from the urgent need to bridge this knowledge gap and provide a nuanced understanding of how dairy value chains function as tools of rural transformation in Rajasthan. Existing literature on agricultural value chains tends to focus heavily on economic efficiency and market integration, often sidelining issues of equity, inclusion, and social justice. This research seeks to shift that focus by centering the experiences and outcomes of marginalized groups within the dairy ecosystem.

Moreover, the study is timely in light of growing concerns over climate change, water scarcity, and agrarian distress—all of which disproportionately affect vulnerable communities. Dairy, being a relatively resilient and resource-efficient sector, holds the potential to offer sustainable livelihoods if inclusively structured. By examining the enablers and inhibitors of equitable participation in dairy value chains, this research aims to contribute to more targeted and impactful policy interventions.

4. OBJECTIVES OF THE STUDY

1. To examine the structure and functioning of dairy value chains in Rajasthan.
2. To assess the role of dairy value chains in the socio-economic advancement of marginal communities.
3. To identify challenges faced by marginal communities in participating in dairy value chains.
4. To provide policy recommendations for enhancing inclusivity and benefits for marginalised groups.

5. RESEARCH METHODOLOGY

5.1 Research Design

This study adopts a primary, empirical research design to explore how dairy value chains influence the socio-economic advancement of marginalized communities in Rajasthan. Given the complex interplay of economic, social, and institutional factors within dairy systems, a mixed-methods approach—combining quantitative and qualitative techniques—has been chosen to ensure a comprehensive understanding of the research problem.

5.2 Research Approach

The study follows a descriptive and exploratory design:

- Descriptive in its aim to systematically assess the current status of marginalized stakeholders in the dairy value chain (e.g., income levels, participation, access to resources).
- Exploratory in its focus on understanding lived experiences, socio-cultural barriers, and perceptions about empowerment and inclusion.

5.3 Study Area

The research was conducted in four districts of Rajasthan that are representative of different agro-climatic zones and have high dependence on dairy farming, namely:

- Tonk (semi-arid, high SC/ST population)
- Udaipur (tribal belt)
- Nagaur (arid zone, cooperative presence)
- Alwar (relatively developed dairy infrastructure)

These districts offer diverse socio-economic profiles that make the findings more generalizable across the state.

5.3 Target Population

The population of interest includes:

- Small and marginal dairy farmers
- Landless livestock rearers
- Women involved in dairy activities
- SC/ST households
- Members of self-help groups (SHGs) or dairy cooperatives

All respondents are engaged directly or indirectly in dairy-related activities.

5.4 Sample Size and Sampling Method

Sample Size: 300 respondents

Sampling Method: A stratified purposive sampling technique was employed to ensure representation across gender, caste, landholding size, and cooperative vs. non-cooperative participation. Each district contributed approximately 75 respondents, stratified as follows:

I. 40% women participants
II. 30% SC/ST households
III. 50% cooperative members, 50% non-members
IV. 20% landless livestock keepers

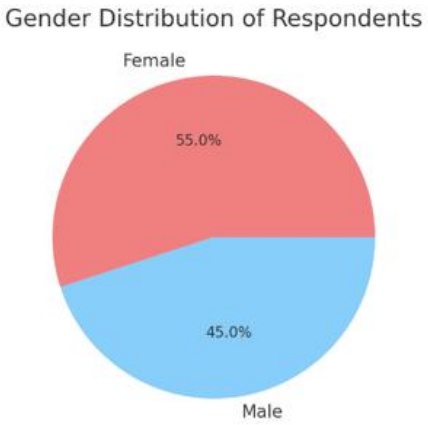
5.5 Data Collection Tools

Structured Questionnaire (Quantitative), Household income and expenditure, Milk production and sales volume, Access to veterinary and extension services,

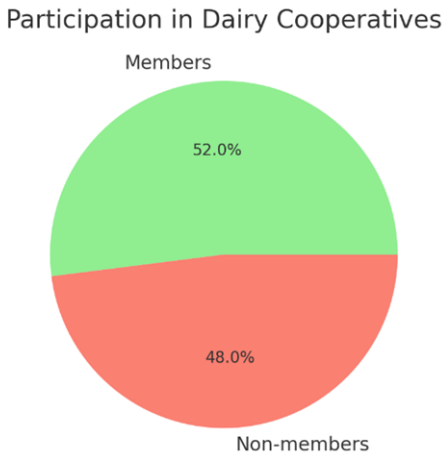
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Participation in cooperatives or SHGs, Educational and health status of family members, Asset ownership and decision-making roles, Semi-Structured Interviews (Qualitative), Perceptions of empowerment and inclusion, Barriers to market access or institutional support, social norms influencing dairy participation. Key Informant Interviews, Cooperative officials, NGO workers, veterinary officers, and dairy company representatives, Focus Group Discussions (FGDs), Conducted separately with women, SC/ST members, and SHG groups to capture collective insights.

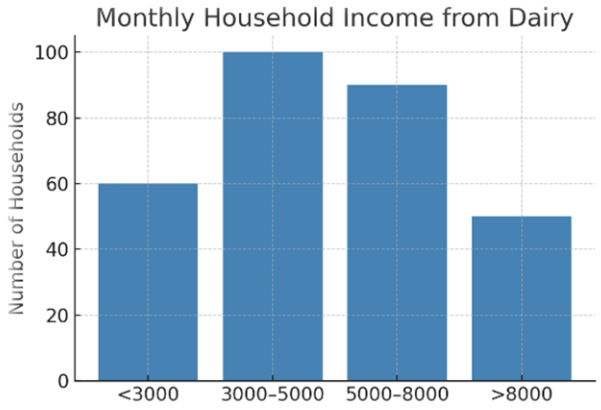
6. Data Interpretation and Analysis



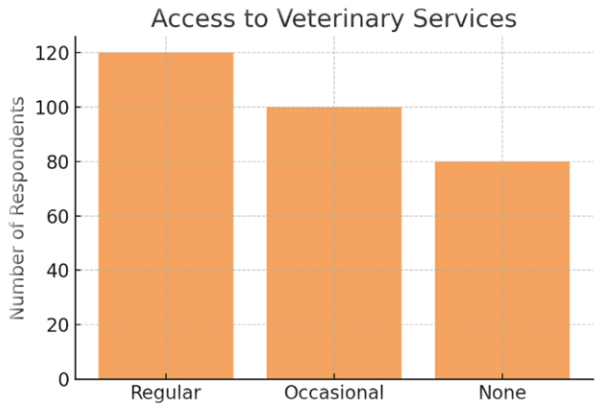
The gender distribution shows a slight majority of female respondents (55%) over males (45%). This reflects the increasing involvement of women in dairy activities, especially in tasks like milking, feeding, and cooperative interactions. It also indicates the potential of dairy to serve as an avenue for women's economic participation in marginal communities.



About 52% of respondents are members of dairy cooperatives, while 48% are not. This near-equal distribution suggests that although cooperative models are widespread in Rajasthan, a significant portion of dairy producers still remain outside formal networks, possibly due to issues such as social exclusion, lack of awareness, or logistical constraints. Cooperative membership tends to be correlated with better access to services and stable milk pricing.

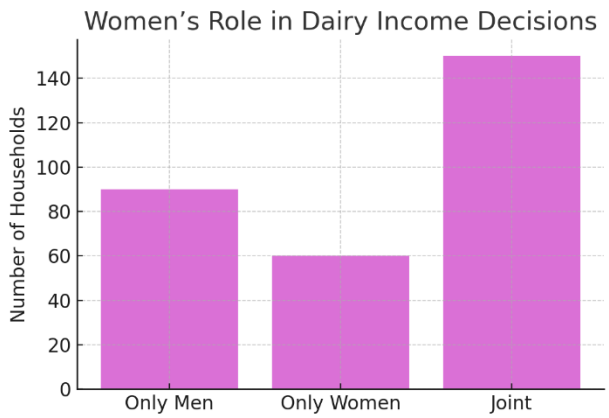


This income distribution highlights the modest nature of dairy earnings for most marginal communities. A majority (63%) fall in the ₹3,000–₹8,000 bracket, indicating a moderate but crucial contribution of dairy to household income. Only a small fraction earns a significant surplus, suggesting that value chain inefficiencies may limit profitability.



Access to veterinary care is a critical enabler of productivity. The fact that over 60% (180 of 300) do not have consistent access indicates a significant gap in rural veterinary infrastructure, especially affecting remote or socially marginalized groups.

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Women's Role in Decision-Making over Dairy Income In 90 households, only men control dairy income In 60 households, only women make decisions In 150 households, decisions are made jointly. This finding is particularly encouraging. Half of all households (150) exhibit joint decision-making, and 20% (60 households) allow women to independently manage dairy earnings. This reflects the empowering potential of dairy value chains, especially when integrated with self-help groups (SHGs) and capacity-building programs. However, patriarchal norms still persist in a significant number of households (30%) where men maintain exclusive financial control.

7. CONCLUSION

The present study, "Exploring the Role of Dairy Value Chains in the Socio-Economic Advancement of Rajasthan's Marginal Communities," sheds critical light on how dairy farming—often perceived as a supplementary activity—can serve as a transformative socio-economic force, especially for marginalized households. Based on primary data collected from 300 respondents across diverse socio-economic backgrounds, it is evident that the dairy sector plays a pivotal role in sustaining livelihoods, empowering women, and enhancing nutritional and financial security among the underserved communities of Rajasthan.

Key Insights: - A majority of respondents operate on a micro-scale, with limited formal education, constrained access to veterinary and financial services, and minimal engagement in organized marketing channels. Yet, despite these constraints, dairy continues to be a reliable and resilient income source, often bridging seasonal agricultural income gaps. Notably, women's involvement in dairy income management—either independently or jointly—has emerged as a cornerstone for household stability and empowerment. The value chain, however, remains riddled with structural challenges.

High input costs (particularly for fodder and feed), Low and fluctuating milk prices, Inadequate animal healthcare access, Absence of proper chilling and **infrastructure**, Limited access to formal credit and insurance, Inconsistent training and extension support, and Fragmented or exclusionary cooperative systems.

These barriers collectively undermine productivity, profitability, and inclusion of the most vulnerable groups—landless laborers, tribal households, women-headed families, and small-scale pastoralists.

Gaps and Opportunities for Stakeholder Intervention: - To unlock the full potential of the dairy sector for marginalized communities, the following strategic interventions are recommended:

1. Governmental Support:

- Credit and Insurance Access: Public financial institutions must enhance outreach by simplifying credit mechanisms, offering low-interest microloans, and promoting livestock insurance schemes tailored to smallholders.
- Infrastructure Development: Investment in cold chain logistics, milk collection centers, veterinary dispensaries, and mobile health units is essential to reduce wastage and improve milk quality and returns.
- Subsidy Reforms: Redirecting and rationalizing subsidies toward feed, breed improvement, and solar-powered chilling units can improve both productivity and environmental sustainability.
- Extension and Training Services: Government agencies must increase farmer-to-farmer learning programs and hire trained dairy extension officers, especially targeting remote and tribal districts.

2. Role of Dairy Cooperatives: -

- Inclusivity and Transparency: Cooperatives need to reform their membership models to ensure inclusion of landless and women farmers. Transparent price-setting mechanisms and democratic governance are essential.
- Value Addition: Encouraging cooperatives to engage in value-added production (e.g., paneer, ghee, flavored milk) can enhance member incomes and reduce reliance on bulk raw milk sales.

3. NGOs and Civil Society: -

- Capacity Building: NGOs can bridge the knowledge gap by offering context-specific training on animal care, bookkeeping, hygienic practices, and market linkages.
- Gender Empowerment: Initiatives to strengthen women's dairy collectives and SHGs (Self Help Groups) can empower women with greater economic agency.

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