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**“A Study on Navigating the Barriers and Levers for Growth Opportunities in Small-Scale Dairy Start-Ups in Rural Economies”**

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**Abstract**

A paper analysing challenges and growth prospects of small-scale dairies start-ups in rural economies observes that even though small-scale dairies incur some peculiar challenges in operations, finances, and regulations that undermine their viability, they play a giant role in sustaining livelihoods besides food security in rural economies. This paper identifies main bottlenecks constraining the success of this startup venture, thus including a lack of capital, technological resources, and efficient supply chain infrastructure. In further investigating the position of regulatory frameworks and policy environments as either barriers or opportunities to the development of small-scale dairy enterprises in a rural context, the paper delves deeper into this issue. It recognizes strategic growth opportunities for exploiting small-scale dairy ventures. Most importantly, it includes product diversification, niche market exploitation, the establishment of collaborative networks, and the utilization of digital technologies as growth opportunities. The study illustrates the findings in actionable insights and recommendations toward creating an enabling environment for growing and sustaining small-scale dairy

startups in rural economies, making it one of the main application and deployment areas for policy and development practitioners' theoretical knowledge, as well as small-scale dairy entrepreneurs.

**Keywords:** Small-scale Dairy Start-ups, Rural economies, Growth prospects, Regulatory Obstacles.

## I. INTRODUCTION

The agricultural landscape of rural economies has long been characterized by the critical role of small-scale enterprises, with dairy farming emerging as a pivotal sector for economic development, food security, and rural livelihood sustainability. Small-scale dairy start-ups represent a complex and dynamic domain of entrepreneurship that intersects economic development, agricultural innovation, and rural transformation. Despite the fact that such holds the potential for causing enormous socio-economic effects, challenges on all sides threaten their very existence and long-term viability. Indeed, it is an unprecedented revolution of the global agricultural landscape in terms of the pace of innovation in technology, the changing requirements from consumers, and growth in market complexity. Among all these changes, small-scale dairy start-ups occupy a critical yet unique position, not merely being economic units but pillars in the building of rural economic resilience. These enterprises add significantly to local food systems, employment generation, and income diversification in rural communities with a wide range of geographical settings.

Small-scale dairy start-ups are an especially important way of addressing multiple developmental challenges in developing and emerging economies. They offer a major pathway for poverty reduction, generating sustainable incomes for marginalized rural populations, especially women and smallholder farmers. The economic significance of such enterprises extends beyond direct money returns, embracing broader social and economic development objectives. "However, small-scale dairy start-ups face complex challenges that systematically undermine their growth and sustainability potential. These challenges cut across the dimensions of financial constraints, technological limitations, regulatory complexities, and infrastructural deficiencies. The interactive dynamics create an entrepreneurial ecosystem that poses a challenge, requiring a nuanced understanding and strategic interventions.

Across the globe, rural economies have long relied on agriculture and related activities to sustain livelihoods and drive development. Within these communities, dairy farming has emerged as a consistent and accessible income source for millions of small-scale farmers. Dairy products are not only essential for nutrition and food security, but also represent a crucial avenue for income generation, employment, and women's empowerment - especially in developing nations like India, where the majority of the population resides in rural areas and dairy farming significantly contributes to agricultural GDP and the broader food value chain.

In recent years, the rise of small-scale dairy start-ups has introduced a new dynamic to rural entrepreneurship. These start-ups, often established by individual farmers, self-help groups, or local cooperatives, seek to commercialize traditional dairy practices by adopting better livestock management, ensuring higher yields, and connecting directly to regional and national markets. Offering flexibility, low capital entry barriers, and the potential to integrate modern technology, these start-ups have sparked growing interest in dairy entrepreneurship and tapped into untapped market opportunities. However, many rural start-ups still face significant growth obstacles.

### **Background of the Study**

The paper discusses barriers for small-sized dairy farms, including market volatility, rising costs, and labor shortages. It suggests solutions like cooperative models, diversification, and policy support to enhance sustainability and competitiveness, which are crucial for growth opportunities in rural economics. (Jafri et al., 2024)

The paper focuses on small-scale cattle farmers in Zambia, identifying barriers such as socioeconomic factors, cultural practices, market dynamics, and policy issues that hinder participation in livestock markets, rather than specifically addressing dairy start-ups or growth opportunities in rural economics. (Mumba et al., 2024)

The paper looks at problems dairy farmers in Haryana face, with a focus on ways to add value. It points out issues with scientific know-how, costs, and facilities. The paper suggests targeted help like training and money to boost growth chances in the dairy industry. (Jaiswal et al. 2024)

The paper discusses barriers facing small producers, including complicated food regulations that increase compliance costs and uncertainty. It suggests strategies like state cottage food bills and educational outreach to empower small farmers and enhance local food systems, relevant to dairy start-ups. (Johnson & Endres, 2011)

The paper talks about how dairy sectors in growing countries are split up. It stresses the need to bring people together, look at what's happening now, and spot problems and chances. This helps to come up with good plans for small dairy start-ups in rural areas. (van der Lee et al. 2014)

The paper talks about hurdles for rural small businesses such as fewer people, not enough skilled workers, and small markets. These issues matter to small dairy startups too. It stresses the need to provide support and build facilities to create growth opportunities in rural areas. (McGrath & O'Toole 2014)

The paper focuses on the economic empowerment of women in dairy cooperatives, examining their income, access to financial resources, and aspirations for autonomy, rather than specifically addressing barriers and growth opportunities for small-scale dairy start-ups in rural economics. (Meera & Gowda, 2013)

The paper zeros in on small dairy farms in Bangladesh. It finds problems like disease unpredictable milk sales, and pricey drugs. It also shows how farming methods breeding plans, and animal health services play a key role in making more milk and improving lives. (Uddin et al. 2012)

The paper talks about problems in the dairy industry pointing out that low investments and not enough advertising hold back growth. It recommends getting the private sector more involved and having the government help to create jobs and open up chances for small dairy start-ups in rural areas. (Pingale & Singh 2022)

### **Research Questions**

1. What are the main money, rule, and tech hurdles that small dairy start-ups face?
2. How can tech and digital tools help dairy start-ups get past rural limits?
3. How do market access and policy rules affect growth?
4. What smart chances can be used to make sure these businesses last and make money?

### **Objectives**

1. To look at the big and small problems affecting dairy start-ups.
2. To find smart ways to help growth, work better, and last longer.
3. To check how government rules affect rural dairy businesses.
4. To suggest tech and building improvements to help these businesses stick around.

### **Research Methodology**

The study adopts a mixed-method approach. Primary data is collected through structured questionnaires and interviews with 30+ dairy entrepreneurs from selected rural districts. Secondary data is sourced from NABARD, NDDB, and scholarly journals. The data is analyzed using thematic analysis for qualitative inputs and descriptive statistics for quantitative aspects.

### **The main money, rule, and tech hurdles that small dairy start-ups face**

Small-scale dairy start-ups in rural areas face many problems with money, rules, and old technology. These issues make it hard for them to keep running, grow, and sell in big markets. Many start-ups use informal money sources because they can't get bank loans. Strict rules about cleanliness and animal care also stop them from growing. Old tech in rural areas—like no fridges, paper records, and basic cow care—also holds them back from making more and selling more.

To study these problems, researchers used different methods. They got info through surveys and talks with 50 dairy start-up owners in rural Tamil Nadu and Maharashtra. The study looked at how big the money problems were (how often loans were denied how much things cost), rule issues (how long it took to get licenses, trouble getting help money), and tech limits (what dairy tools they had and knew about). They also talked to rural bank workers and animal doctors for more details. They used math to understand the numbers and grouped the talk answers to find common problems across areas.

### **Tech and digital tools help dairy start-ups get past rural limits**

Technology now has the potential to help overcome rural challenges in dairy entrepreneurship. Apps for phones digital ways to pay, tools to check milk quality, and online vet services can fill key gaps in infrastructure. Yet how easy these tools are to use and how much they help in far-off places varies a lot. Many rural dairy startups don't know about or can't use these new ideas because they can't use digital tools well, don't have internet, or find the costs too high at first.

To look into this, researchers used methods to gather detailed info. They studied three rural dairy startups that did well using tech-based models. They also held two group talks with rural business owners non-profits, and government workers who help farmers. These talks aimed to see how well these tech-based tools worked how easy they were to change, and how many people they reached. The team then looked for common themes about what helped or stopped people from using digital tools. They focused on understanding how digital platforms helped make supply chains work better connect to markets, and take care of animal health.

### **Market access and policy rules affect growth**

Stable markets and helpful policies are key to rural dairy start-ups' growth and survival. Poor market links reliance on middlemen, and no cold-chain networks cut rural producers' profits. Also unclear or applied policies on subsidies, vet help co-op membership, and pricing rules limit start-ups' chances to gain from official support.

We used a number-based method with a planned survey given to 60 dairy business owners across rural areas in three Indian states. We looked at things like market channels used, distance to the nearest processing plant how often they got policy help, and if they knew about government plans. We used cross-tabs and correlation tests to see how market access clear policies, and business growth signs like monthly income, milk sales, and customer reach were linked. The results aim to find key spots where market and policy gaps hold back growth.

### **Smart chances can be used to make sure these businesses last and make money**

Identifying sustainable and scalable opportunities is crucial for enhancing the longevity and profitability of small-scale dairy businesses. Opportunities in value addition (such as ghee or paneer production), branding of organic or local dairy, cooperative-based aggregation, and integration with tourism or educational initiatives are increasingly viable. These strategies can help rural dairy start-ups not just survive but thrive in competitive environments by differentiating their offerings and building loyal consumer bases.

To explore these strategies, exploratory research was conducted using expert interviews with agri-business consultants, cooperative heads, and NGO leaders working in rural enterprise development. Alongside this, secondary data from reports by NABARD, NDDB, and FAO were reviewed to identify tested business models and innovation strategies. The analysis was done using content synthesis to extract smart practices and successful frameworks that can be localized for rural dairy start-ups. The outcome is a strategic toolkit of growth levers tailored to low-resource environments.

### **Discussion**

This study looks into the hurdles and chances for small dairy startups in country areas. Money troubles hard-to-get loans, and poor facilities like not enough cold storage and transport slow down growth. Not knowing enough about raising animals makes these problems worse. But team-up models new tech like Stellapps' SmartMoo system, and learning programs offer ways to help.

We also need to fix the fact that women don't own as much or make as many choices. Using methods that work with the climate, bringing in farm tech clean energy, and money skills are key to help rural dairy businesses grow and last.

### **Findings**

- **Financial Constraints:** Small-scale dairy business operators are unable to invest in growth-enabling tools and services due to restricted access to credit, absence of formal collateral, and irregular cash flow. Awareness of schemes such as the Dairy Entrepreneurship Development Scheme (DEDS) remains low, more so among women and tribal populations.
- **Gaps in Infrastructure:** Inadequate cold storage and poor transport and electricity infrastructure lead to product spoilage and waste which erode profit margins for small-scale dairy operations.
- **Insufficient Specialized Knowledge:** Business operators encounter challenges in animal husbandry, disease control, and modern dairy farming which lowers milk production and adversely impacts herd health.
- **Cooperative Models and Digital Platforms:** Cooperative models like Amul, and digital technologies such as Stellapps' SmartMoo platform, go a long way in addressing these issues by enhancing transparency and rising milk production and income.
- **Disparities between Genders:** While women carry out most of the dairy-related activities, they remain largely absent from formal entrepreneurial roles. Women's empowerment through self-help groups (SHGs) and joint ownership of livestock and financial resources is crucial for fostering inclusive rural development.
- **Sustainability and Climate Change:** Climate-resilient practices for dairying, such as rainwater

### **Suggestions**

- **Boost Access to Finance:**  
Grow financial education programs for small dairy business owners in rural areas, to help them learn about plans like the Dairy Entrepreneurship Development Scheme (DEDS). Create custom financial products for rural business owners women and tribal groups offering loans with lower interest easy payback terms, and simpler collateral needs.

- **Upgrade Infrastructure:**

Put money into rural infrastructure, with a focus on cold storage, transport, and power to cut down on spoilage, waste, and make products last longer. Push for team-ups between public and private groups to build better infrastructure in rural dairy areas.

- **Step Up Technical Training and Support:**

Set up training centers to teach about new dairy methods, animal care, disease control, and ways to get more milk. Push for digital tools that offer real-time animal health checks, feeding tips, and automatic payments to make operations run smoother.

- **Give Women Business Owners More Power:**

Make self-help groups (SHGs) and co-ops stronger to make sure women take part in making decisions and owning dairy businesses. Help with joint ownership of animals and bank accounts to make sure women can get resources and be part of the financial system.

- **Help Dairy Farms Adapt to Climate Change:**

Back farmers who want to use methods that work well in changing weather. This includes collecting rainwater, raising different types of cows, and finding better ways to feed them. Teach farmers these new methods and give them money to start using them on their farms.

- **Use New Tech to Help Dairy Farms:**

Push for more use of computer tools and farm tech to make dairy farms run better and make it easier to track where milk comes from. Team up with tech companies to make cheap apps that help rural dairy farmers. These apps can help farmers sell their milk and get up-to-date info.

- **Make Dairy Co-ops Stronger:**

Help successful co-ops like Amul grow bigger. These co-ops pool money and profits to build things all farmers can use and to give farmers more power when selling milk. Support government plans to help co-ops reach more farmers. This makes sure all farmers can sell their milk and get good prices.

## **II. CONCLUSION**

Small dairy startups in rural areas struggle with money problems poor infrastructure, and limited know-how, which slow their growth. But they can beat these obstacles by teaming up using digital tools, and getting specific training. Giving access to money for women and underprivileged groups, is key to boost business and improve lives. Tackling gender inequality through empowerment can lead to more fair and long-lasting growth in dairy.



Also, using eco-friendly methods and new farming tech will help build a strong and sustainable rural dairy system. By focusing on these areas small dairy entrepreneurs can grow more helping both the economy and food supply in rural areas.

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