Cheese Revolution: The Thakurgaon Story

A Value Chain Impact Assessment of Cheese Production and Marketing in Thakurgaon, under the Safe Meat and Dairy Products Market Development Value Chain Sub-Project

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PREFACE

"Assessment of Cheese Production & Marketing under the Safe Meat and Dairy Products Market Development Project" is an impact assessment of cheese production conducted under the sub-project "Market System Development of Safe Meat and Dairy Products", implemented by ESDO as part of the Rural Microenterprise Transformation Project (RMTP). RMTP is implemented by the Palli Karma-Sahayak Foundation (PKSF) and jointly funded by the International Fund for Agricultural Development (IFAD) and the Danish International Development Agency (DANIDA).

The assessment was conducted by **Md. Saifuddin Khaled**, CEO, GMark Consulting Limited, specializing in market systems development, monitoring and evaluation, and inclusive private sector engagement. Special thanks are extended to **Founder Executive Director of Eco-Social Development Organization (ESDO) Dr. Md Shahid Uz Zaman and Dr. Babul Chandra Barman, Project Manager** of the **"Safe Meat and Dairy Products Market Development Sub-project,"** for their valuable support and contributions throughout this study.

EXECUTIVE SUMMARY

The **"Assessment of Cheese Production & Marketing under the Safe Meat and Dairy Products Market Development Project"** was conducted in May–June 2025 to assess the outcomes and systemic impacts of interventions implemented by **ESDO** under the **Rural Microenterprise Transformation Project (RMTP)** in Thakurgaon. Using a **Market Systems Development (MSD)** approach, the project addressed constraints across the cheese value chain to improve productivity, market access, and enterprise viability.

Thakurgaon, once reliant on informal cheese production, has become a growing hub, now meeting approximately **75% of Bangladesh's mozzarella and processed cheese demand**. This shift has reduced import dependency and increased local value addition.

At RMTP's outset, only **13 factories** were operational. By the project's end, this grew to **37**, comprising **23 large**, **8 medium**, and **6 small-scale enterprises**. These factories now process **3,5000–4,2000 liters of milk daily**, producing **4.3 tons of cheese**. Strong market linkage development allowed producers to reach formal retail, institutional buyers, and export markets.

Today, **23 factories maintain business standards**, with **17 ISO-certified** and **5 holding BSTI certification**, improving product credibility and market reach. The project also established robust backward linkages, engaging **6,585 dairy farmers** and **75 goalas (milkmen)** across **55 milk collection points**, ensuring steady access to quality milk. The introduction of milk testing tools helped improve input quality and consistency.

RMTP interventions have created employment for **245 individuals**, the majority being women. These roles span production, packaging, and quality control, contributing to improved household income and women's participation in rural enterprise.

To overcome technical inefficiencies, RMTP introduced **modern machinery** such as cheese vats, cream separators, milk analyzers, and vacuum packaging units, replacing manual systems and increasing efficiency. Over **240 entrepreneurs and factory workers** received training on cheese production, hygiene, and business operations, leading to better quality control and productivity.

Environmental concerns were addressed through innovative waste management solutions. Previously discarded whey—a by-product of cheese production—is now being converted into ghee, creating a new income stream while minimizing pollution. RMTP also promoted improved sanitation practices within factories, including structured cleaning protocols and waste reduction mechanisms.

Challenges like limited hygiene compliance, lack of cold storage, weak branding, and restricted financing were addressed through microcredit, support for certifications, and expanded market channels. Factories are now exploring digital platforms and modern retail networks to grow further.

Thakurgaon's cheese sector has also begun exporting, reaching **South Korea and Canada**, signaling its readiness for global markets. The project's ecosystem-wide impact is evident in rising farmer incomes, stronger supply chains, and renewed confidence from financial institutions and input providers.

By strategically addressing core challenges and unlocking market potentials, RMTP has positioned Thakurgaon's cheese sector for sustainable, inclusive, and long-term growth.

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1 INTRODUCTION

1. Introduction

1.1 Background

Jointly funded by the International Fund for Agricultural Development (IFAD) and the Danish International Development Agency (DANIDA), the Rural Microenterprise Transformation Project (RMTP) is implemented by Palli Karma-Sahayak Foundation (PKSF) to improve income, food security, and nutrition of small and marginal farmers, micro-entrepreneurs, and value chain actors involved in selected high-value agricultural products. In addition to the objective of extending financial services, the project promotes value chain development for selected agricultural sectors with strong market demand and high growth potential.

To alleviate poverty in Bangladesh, the RMTP project delivers financial and technical assistance, ensures access to safe inputs and services, facilitates technology transfer, and supports the mechanization of farms and processing facilities. It also promotes the production, certification, and marketing of processed agricultural, fisheries, and livestock products. Through 76 value chain sub-projects across the livestock, fisheries, and agriculture sectors, RMTP has reached 611,491 farmers, entrepreneurs, and market actors in 47 districts nationwide.[1] "Safe Meat and Dairy Products Market Development" is one of the sub-projects under PKSF's broader RMTP initiative. Through this sub-project, ESDO is strengthening the resilience of small-scale enterprises by promoting safe dairy and meat production and increasing market linkages among livestock value chain actors.

Context of the Sub-Sector

According to FAO, the livestock sector is rapidly growing in developing countries due to increasing demand for meat and dairy products. While parts of the sector, such as cattle and poultry, are shifting toward large-scale production similar to developed countries, smallholders still dominate in many regions of the developing world. This structural transformation raises important concerns about roles of smallholders and their preparedness in meeting future demand and how it will affect food security and poverty. Livestock supports rural livelihoods by providing income, nutrition, fuel, draught power, energy, and fertilizer. As supply chains become more complex, the sector presents opportunities for inclusive growth and poverty reduction across the value chain, involving diverse market actors and offering benefits at multiple levels of production and processing. Therefore, productivity growth in livestock is leading to economic growth, poverty reduction and food security.

The livestock sector in Bangladesh, along with its market and production landscape, has been experiencing gradual shifts over the past few years. With increasing economic growth and nutritional awareness, meat, milk, and dairy products are playing a vital role in enhancing food security by providing a stable source of essential nutrients, including protein, calcium, vitamins, iron and zinc. These livestock products contribute to more diversified diets and improved nutrition.

According to the national data published by Department of Livestock Services (DLS), the livestock subsector in Bangladesh grew by 3.15% in 2023/24, contributing 16.33% to agricultural GDP and 1.8% to national GDP. Between 2014/15 and 2023/24, milk production more than doubled from 6.97 to 15.04

[1] https://pksf.org.bd/projects/rural-microenterprise-transformation-project-rmtp/

million metric tons, showing steady annual growth. Meat production also increased, rising from 5.86 to 9.23 million metric tons over the same period, although at a slower pace than milk.

Although the national data and research suggest that milk production is improving steadily, the average dairy yield of milk per milking cow in Bangladesh remains very low. According to BIHS data published in 2018/19, the average milk yield per cow in Bangladesh is only 1.0 liter per day, from as low as 0.4 liters in Barisal Division to 1.5 liters in Dhaka Division. On the other hand, in India, exotic cows produce around 11.4 liters per day, and the average milk yield of indigenous cows is about 4.2 liters (Statista 2024). This significant gap emphasizes the urgent need to improve dairy farming practices in Bangladesh to boost productivity. An analysis conducted by IFPRI (2024) using BIHS data suggests that several factors can substantially enhance dairy and meat production in Bangladesh. These include the use of artificial insemination (AI), improved nutrient-rich feeding practices, access to veterinary health services, increased availability of vaccines and deworming treatments, and adaptation of mechanization and technologies.

ESDO's Initiatives under RMTP

Of all its initiatives, one notable sub-project under RMTP is the "Safe Meat and Dairy Products Market Development" initiative, implemented by Eco-Social Development Organization (ESDO) in Thakurgaon district. Among its key achievements, the project revitalized the local cheese value chain—drawing on the region's historical tradition of cheese-making and capitalizing on a steady supply of high-quality milk. Through targeted interventions such as capacity building, improved processing techniques, market linkages, and branding, the project significantly strengthened the entire value chain. As a result, local cheese production has become viable and profitable, positively impacting farmers, milk suppliers, processors, distributors, and retailers alike. This also created employment opportunities for many rural residents—particularly women—contributing to their socioeconomic empowerment.

In a country where cheese was once considered an exotic product, RMTP's support played an essential role in standardizing and institutionalizing this emerging value chain, setting a replicable model for inclusive dairy enterprise development in rural Bangladesh.

1.2 Project Approach

The implementer of the sub-project, ESDO, recognized that cheese production in Thakurgaon is predominantly driven by private sector initiatives, with limited public sector involvement in enterprise support, market access, and technical services. Given that producers, processors, distributors, and consumers are all embedded within local and national market systems, ESDO adopted a market systems development approach rooted in a detailed value chain analysis of the dairy and cheese sector in the region. This approach helped identify systemic constraints and opportunities, guiding targeted interventions to enhance productivity, quality, and market connectivity across the cheese value chain.

1.3 Objectives of the Document

The document presents a comprehensive study on cheese production and marketing in Thakurgaon, highlighting the overall activities and impact of the sub-project implemented by ESDO under RMTP. It captures how microenterprises have overcome challenges to reach higher standards by adopting RMTP's prescribed environmentally friendly practices under the Safe Meat and Dairy Products Market Development initiative. Additionally, the study places the achievements of the sub-project in both

national and international contexts, showcasing its significance, scalability, and contribution to sustainable rural enterprise development.

1.4 Scope and Methodology

Method:

The sample respondents for this study were purposively selected from the sub-project implementation areas within **Thakurgaon district**, where ESDO is currently implementing the "Safe Meat and Dairy Products Market Development" sub-project under the Rural Microenterprise Transformation Project (RMTP). These areas were chosen based on their active engagement in cheese production and their exposure to various project interventions. The study primarily focuses on the **evolving cheese value chain**, aiming to provide an in-depth assessment of its different stages — including milk collection and cheese production, value addition through hygienic processing and packaging, marketing strategies employed by local entrepreneurs, and the changing consumption patterns of end consumers. Special attention is given to how project-supported interventions — such as training, financial assistance, market linkage facilitation, and quality control measures — have contributed to systemic changes in the value chain, improved livelihoods, and enhanced the commercial viability of cheese enterprises in Thakurgaon.

Participants:

To understand the extent of systemic changes in business models and practices introduced through the RMTP sub-project, the study engaged a diverse group of **market actors** who play critical roles across different stages of the **cheese value chain**. Respondents included **dairy farmers**, who are the primary producers of raw milk**; cheese processors**, who are responsible for transforming milk into market-ready cheese products; and factory workers, who assist in the day-to-day operations of processing units.

Additionally, **milk collectors (goalas)** and **vendors** were interviewed to capture insights into milk aggregation and local-level distribution dynamics. The study also included **input and service providers**, such as **packaging vendors, machinery suppliers, and veterinarians,** who support value addition and quality assurance across the chain. To further explore the integration of complementary services, local **feed entrepreneurs** were consulted to understand how improved animal nutrition is contributing to milk productivity and quality.

By capturing perspectives from this broad spectrum of stakeholders, the study aimed to provide **a holistic view** of how RMTP interventions have influenced **market behavior**, **improved coordination** among actors, and **enabled the adoption** of more **sustainable and commercially viable business practices** within the cheese sector.

Data Collection Approach:

The study adopted a **mixed-method approach** to capture the depth and breadth of systemic changes within the cheese value chain. A combination of qualitative tools was used to gather nuanced insights from various market actors and stakeholders.

Key data collection methods included:

- **Key Informant Interviews (KIIs):** Conducted with cheese processors, market intermediaries, service providers, and institutional representatives to gather expert opinions and strategic perspectives.
- **Focus Group Discussions (FGDs):** Organized with groups of dairy farmers, factory workers, and women entrepreneurs to capture collective experiences, behavioral shifts, and community-level outcomes.
- **Case Documentation:** In-depth case studies were developed to highlight success stories, trace business model evolution, and illustrate the real-life impact of project interventions.

Guiding Themes and Objectives:

Respondents were engaged using a structured set of guiding questions aimed at capturing:

- **Shifts in business practices** and operational models adopted by value chain actors.
- **Changes in market engagement**, including new customer segments, supply chain improvements, and regional expansion.
- **Adoption of standards** related to hygiene, food safety, and environmentally sustainable practices.
- **Enterprise growth trajectories**, such as increased production capacity, profitability, or investment in advanced technologies.
- **Enabling role of RMTP interventions**, such as training, technical support, market linkages, and access to finance.

Focus on Sustainability and Systemic Change:

In addition, the study explored:

- **Barriers previously faced by microenterprises**—including financial constraints, technical gaps, and market access limitations.
- **Strategies and support mechanisms** that helped these enterprises overcome challenges and adopt safer, greener production methods.
- **Impacts on local livelihoods**, particularly among smallholder farmers, women, and youth.
- **Influence on the broader market system**, including improvements in service ecosystems, buyer-seller relationships, and overall competitiveness of the cheese sector in Thakurgaon.

2 HISTORY AND SECTOR OVERVIEW OF THE CHEESE INDUSTRY IN THAKURGAON

2. History and Sector Overview of the Cheese Industry in Thakurgaon

2.1 The History of Thakurgaon's Cheese Industry

The cheese industry in Thakurgaon began as an innovative solution to a common rural challenge: the low profitability of raw milk. In the late 1980s, Humayun Reza, a development worker in the region, recognized the potential of value-added dairy processing. In 1988, he founded HADS, focusing on agriculture and livestock. With early support from international advisors, he helped introduce cheese-making techniques to Thakurgaon, and by the late 1990s, mozzarella cheese suited for Bangladesh's climate was being produced and marketed in Dhaka's high-end hotels and restaurants.

Determined to turn his vision into reality, Reza invited two consultants from Denmark in the mid-1990s to help adapt mozzarella cheese recipes to Bangladesh's tropical climate. By 1998, Thakurgaon had successfully produced its first batch of locally suitable mozzarella cheese. This breakthrough gained attention, and HADS sold 50 kilograms of cheese at the prestigious Sonargaon Hotel in Dhaka—marking the commercial beginning of cheese production in the region.

Rise of the Cheese Market in Thakurgaon

Humayun Reza's background with international NGOs and access to elite networks enabled him to establish strong market linkages, with renowned hotels and clubs like Westin, Radisson, Canadian Club, and British Club sourcing Thakurgaon-made cheese. To formalize the business and access financial resources, Reza founded Eminent Agro Limited in 2003. Supported by the Canadian ambassador and American experts, cheese-making technology advanced significantly.

A pivotal development during this period was the training of local women by foreign experts, which expanded production capacity and laid the foundation for women's economic empowerment in the district. The favorable climate and the availability of high-quality milk gave Thakurgaon a unique advantage for producing premium cheese. As demand surged—fueled by the restaurant boom and a growing domestic appetite for pizza, pasta, and continental cuisine—small-scale cheese factories began to multiply across the district, with women playing a vital role in this expansion.

Why Thakurgaon?

Thakurgaon's cooler climate and its geographical proximity to the Himalayas have made it uniquely suited for cheese production in Bangladesh. The colder environment naturally supports cheese maturation and flavor development, setting the district apart from other regions in the country, where warmer temperatures challenge cheese preservation and quality consistency.

Several factors have contributed to Thakurgaon's emergence as a hub for high-quality cheese:

- **Favorable Natural Conditions**: The region's cooler temperatures not only support the cheese aging process but also help maintain product quality during storage and transport. This has been a key comparative advantage for local producers.

- **High-Quality Milk Supply**: Cheese producers in Thakurgaon attribute much of their product's success to the quality of milk sourced directly from local dairy farmers. This farm-to-factory linkage has strengthened the value chain and ensured consistent input quality.
- **Strong Hygiene Standards**: All operational cheese factories in Thakurgaon uphold strict hygiene protocols. Workers wear sanitized white uniforms, maintain personal hygiene, and regularly disinfect equipment and production areas using vinegar. Factory floors are kept spotless, with entry strictly limited to authorized personnel, reinforcing food safety and quality assurance.
- **Positive Cultural Spillovers**: The clean and structured working environment in these factories is influencing household practices. Factory workers report that the cleanliness protocols they follow at work have inspired similar habits within their families and communities.
- **Growing Industrial Ecosystem**: The cheese industry in Thakurgaon is experiencing steady growth. In just three years, the number of operational cheese factories rose from 13 to 37, reflecting increasing investor confidence and market demand. This expansion is supported by both government and development sector initiatives.
- **Institutional Support**: Several agencies, including the Department of Livestock (DLO), the Bangladesh Small and Cottage Industries Corporation (BSCIC), and NGOs such as ESDO under the RMTP project, have played a key role in supporting the growth of Thakurgaon's cheese industry. They provide advisory services and financial assistance to selected factories. In addition, the sector benefits significantly from the involvement of both local and international development organizations that are helping to build capacity, upgrade technologies, and expand market access.

As domestic culinary trends evolve and demand for mozzarella and other varieties rises, Thakurgaon has positioned itself as a center of excellence in cheese production—driven by a combination of natural advantage, quality inputs, disciplined processing, and growing institutional support.

Challenges before RMTP: Stagnation and Fragmentation

Despite early successes, the cheese industry in Thakurgaon faced significant hurdles. Many factories struggled due to lack of standardized production methods, inadequate hygiene practices, poor access to finance, weak market linkages, and low technical capacity. By 2022, only 13 cheese factories remained functional, and even those operated below capacity. The absence of quality assurance mechanisms and standardized branding meant that many businesses could not compete or sustain themselves.

RMTP's Strategic Interventions at a Glance: Turning Potential into Performance and Scale-Up

Recognizing the untapped potential of Thakurgaon's cheese industry, the Rural Microenterprise Transformation Project (RMTP)—jointly funded by IFAD and DANIDA, and implemented by PKSF through ESDO—intervened in 2022 under the "Safe Milk and Milk Product Market Development" initiative. The project began by assessing the capacity, hygiene standards, and overall readiness of existing factories, most of which were operating below potential. RMTP then provided targeted financial support through grants and microloans, enabling entrepreneurs to expand and modernize their operations. Alongside this, producers received hands-on technical training from national and international experts to improve production methods, hygiene practices, and business management. Infrastructure support allowed factories to install clean, mechanized facilities suitable for large-scale processing and packaging, while ensuring decent work conditions for workers. The project also emphasized standardization, helping factories work toward meeting BSTI, ISO, and export-quality certifications to tap into larger markets.

Finally, RMTP strengthened both backward and forward market linkages, connecting producers with quality milk suppliers and expanding access to high-value urban markets.

With its historical grounding and RMTP's system-changing interventions, Thakurgaon has emerged as one of South Asia's largest cheese-producing regions. Today, a significant number of cheese factories are operating in the district, with RMTP directly working with 37 of them—most of which were established in the last three years. Currently, these factories collectively process 35,000–40,000 liters of milk per day, producing 4.345 tons of cheese daily. The cheese is now distributed across Bangladesh—from local shops to high-end restaurants—and is also exported to countries like South Korea and Canada, reducing reliance on imports and fostering a sustainable domestic and international market.

Masuma Khanam: A Model of Entrepreneurship and Women's Empowerment in Thakurgaon

Masuma Khanam, a woman entrepreneur from Nischintapur in Thakurgaon, stands as a powerful example of rural transformation through enterprise. What began in 2012 with just 27 litres of milk has now grown into **Dimension Food Products**, a thriving cheese business that processes 2,500 litres of milk daily. Her enterprise currently employs 18 individuals—13 women and 5 men—and operates three additional branches, showcasing a model of inclusive local economic development.

With support from the **Rural Microenterprise Transformation Project (RMTP)**, Masuma overcame the typical barriers rural entrepreneurs face—lack of capital, market access, and technical knowledge. Through RMTP, she received essential machinery, hands-on training, and connections to buyers, along with assistance in acquiring BSTI and ISO certifications. These interventions led to a 15% increase in production, sales, and income, with her annual turnover now reaching BDT 3.24 million.

But Masuma's impact goes beyond the numbers. Her business has become a local employment hub and a beacon of inspiration for other women and small-scale dairy producers. By turning a household initiative into a certified enterprise, she has demonstrated how rural women can lead resilient and profitable ventures.

Her commitment to hygiene, quality, and sustainability mirrors RMTP's vision of eco-friendly rural economies. As consumption of dairy products rises in the region, Masuma aims to further expand her operations and buyer network—already including five formal agreements—ensuring long-term community impact. Masuma's story reflects the transformative power of targeted development support and highlights how rural entrepreneurs can drive inclusive growth and sustainability.

2.2 Current Sector Overview

Cheese: A High-Potential Solution to Milk Surplus and Value Addition

An analysis of livestock and dairy market trends reveals that **diversifying milk-based products is essential** for increasing both the consumption and price of raw milk in Bangladesh. While liquid milk consumption has grown, it remains insufficient to absorb the full production capacity of dairy farmers, particularly smallholders. In this context, **cheese production has emerged as a promising solution**, and Thakurgaon stands out as a leading example of how localized innovation can drive sector-wide transformation.

By converting surplus milk into value-added products such as mozzarella, Thakurgaon has shown how rural enterprises can significantly enhance national demand and economic value, while improving rural livelihoods.

A Growing Domestic Cheese Industry

The **Bangladeshi cheese market is on a strong growth trajectory**. According to *Statista*, cheese market revenues in Bangladesh were projected to reach **USD 960 million in 2024**, with a **compound annual growth rate (CAGR) of 9.7%** between 2024 and 2028. This upward trend is fueled by shifting dietary habits, growing urbanization, the rise of fast-food culture, and increasing availability of locally produced cheese.

In Thakurgaon alone, an estimated **35,000–42,000 liters of milk are processed daily** into mozzarella cheese—equivalent to **approximately 4.345 tons per day**. This represents nearly **75% of Bangladesh's total mozzarella cheese demand**, positioning Thakurgaon as a national leader in this high-value segment.

Systemic Support and Inclusive Growth through RMTP

Despite its potential, the cheese sector has long faced constraints such as a lack of standardization, outdated processing technology, limited market access, and weak compliance with food safety standards. To address these challenges, **Eco-Social Development Organization (ESDO)**, under the **RMTP initiative implemented by PKSF**, adopted a **market systems development (MSD) approach**. This involved targeted investments in:

- Enterprise capacity building
- Infrastructure and modern machinery
- Hygiene and food safety training
- Market linkage facilitation

As a result, the sector is becoming more **formalized, inclusive, and scalable**, creating ripple effects across the local economy.

Widespread Backward Linkages and Ecosystem Development

The rapid growth of the cheese industry in Thakurgaon has been backed by strong backward linkages:

- **6,585 dairy farmers** are now linked with cheese factories, ensuring a consistent supply of good-quality milk.
- **75 goalas (milk collectors)** are directly connected to the factories via **55 milk collection points**, improving efficiency and traceability.

- A total of **2,500 grass cultivators**—operating on land ranging from **50 decimals to 10 acres**—now support fodder supply for dairy cattle.
- RMTP has also helped develop **eight specialized grass markets**, improving access to quality fodder inputs.
- **Skilled labor** is readily available at a **reasonable cost of BDT 5,000–15,000 per month**, reducing operational overheads for enterprises.
- All other relevant market actors—such as machinery suppliers, packaging vendors, and transporters—are accessible within the ecosystem, creating a well-rounded value chain.

Enterprise Financing and Expansion

Access to finance has been a game-changer for many cheese producers. Under RMTP, **31 cheese factories have received loans from ESDO**, ranging from **BDT 200,000 to 1,000,000**. These financial injections enabled them to scale operations, purchase advanced machinery, improve factory standards, and meet market demand more efficiently.

A Potential Sector: Cheese as a Driver of Economic Growth

With the availability of **high-quality milk at relatively low prices**, Thakurgaon's cheese industry has a cost advantage that can be leveraged further. As Bangladesh looks to enhance the livestock sector's contribution to GDP and rural employment, the cheese industry offers a **viable pathway** to:

- Reduce post-harvest milk loss
- Empower rural women and smallholders
- Promote food diversification
- Strengthen rural-to-urban market linkages
- Position cheese as a future export commodity

With continued investment in **quality assurance, innovation, certification, and export readiness**, cheese has the potential to become a mainstream product both **domestically and internationally**, aligning with the government's **Vision 2041** for inclusive and sustainable economic growth.

Thakurgaon Overtakes Sirajganj in Cheese Production and Export

While Sirajganj is long known as Bangladesh's largest dairy hub, Thakurgaon is rapidly emerging as the country's new leader in cheese production and export. Sirajganj hosts 9 cheese factories with a daily output of 3,500–3,800 kg, whereas Thakurgaon has developed 37 factories producing 4,500–4,800 kg of cheese daily.

A major strength of Thakurgaon is its quality standards—17 factories are ISO certified, enabling mozzarella exports to South Korea, Canada, the UK, and other markets. Moreover, the district's cheese industry fosters inclusive employment, with 245 marginalized individuals—including widows and ultra-poor men and women—directly engaged in factory operations.

Thakurgaon's rise illustrates how strategic investment, quality assurance, and social inclusion can drive rural transformation in the dairy sector.

Thakurgaon Cheese Value Chain:

The cheese industry in Thakurgaon has evolved into a structured and high-potential value chain, driven by strong market demand, high-quality milk supply, and catalytic support from government and non-government actors. Below is an explanation of the core value chain, alongside the various supporting roles that contribute to its sustainability and scale.

Main Value Chain Steps:

1. **Farmers:** Smallholder dairy farmers are the foundation of the cheese value chain. They raise cattle and supply raw milk. With support from livestock services, many have improved milk yield and quality by adopting better feeding, animal health practices, and breed selection.
2. **Goala (Milk Collecting Middlemen):** Traditional milkmen (Goalas) collect milk from farmers and deliver it to local directly to cheese factories or chilling centers. They play a vital role in connecting dispersed farmers with formal processors, especially in remote villages.
3. **Chilling Plant / Milk Collection Points:** These facilities receive milk and preserve its quality by immediate chilling. Operated either by local entrepreneurs or cheese factories, they ensure that milk maintains hygienic standards before processing.
4. **Cheese Factories:** At the core of the value chain, these factories process chilled milk into cheese, primarily mozzarella, under hygienic conditions. Thanks to technical training and infrastructure upgrades (under RMTP), many now use mechanized production, standardized packaging, and meet food safety standards. Women's involvement is significant at this stage, with many engaged in production and packaging.
5. **Suppliers / Vendors:** These intermediaries distribute cheese from factories to urban retailers, restaurants, and institutional buyers. Some vendors specialize in cold-chain logistics to maintain product quality during transport.
6. **Restaurants / Retailers:** Urban restaurants, fast food chains, pizza shops, and retail stores represent the primary market for Thakurgaon cheese. Additionally, vendors supply to super shops and grocery chains, making cheese increasingly available for household consumption. The rising popularity of cheese-based dishes has boosted demand across both food service and domestic markets, allowing retailers to shift from imported to high-quality, locally produced cheese.
7. **Consumers:** End-users include both individual households and food businesses. Consumer awareness of food safety, quality, and affordability is increasing demand for domestically produced, traceable cheese.

GO/NGO Actors

These are not direct market actors but play a critical role in **catalyzing and enabling the development** of the cheese value chain through regulation, service facilitation, and institutional support:

- **DLO and ULO (District & Upazila Livestock Offices):** These public offices provide oversight and coordination of livestock-related services. While providing some direct supports, they monitor veterinary practices, promote animal health and artificial insemination (AI), and ensure compliance with government regulations—helping to create an enabling environment for safe and productive dairy operations.
- **BSTI (Bangladesh Standards and Testing Institution):** BSTI supports cheese producers by offering food safety certification, quality assurance, and guidance on proper labeling, which is crucial for accessing formal retail and export markets.

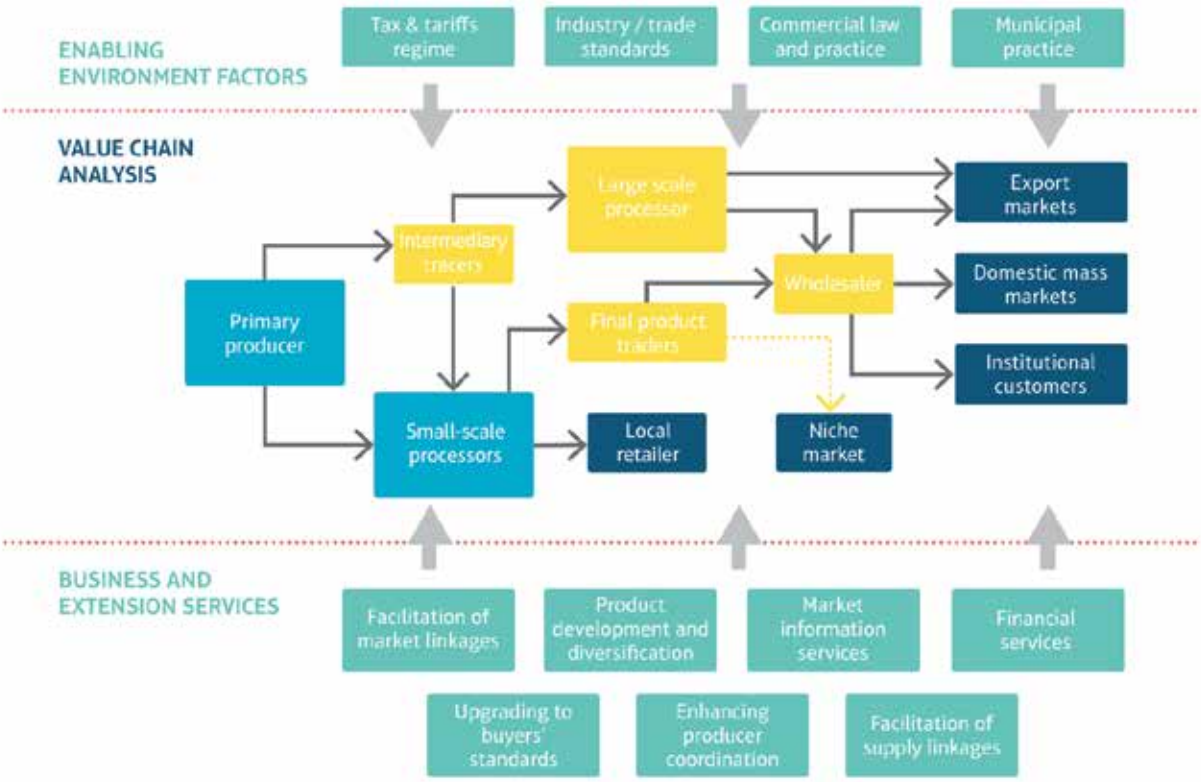
- **BSIC (Bangladesh Small and Cottage Industries Corporation):** BSIC plays a facilitative role in promoting small-scale factory development**,** offering technical assistance, business advice, and occasionally financial incentives or subsidies to help agro-enterprises grow.
- **NGOs like ESDO (Eco-Social Development Organization):** ESDO has long been involved in rural enterprise development, providing microfinance, training, women's entrepreneurship support, and market linkage. Its work in the cheese sector reached a new level of scale and impact under PKSF's Rural Microenterprise Transformation Project (RMTP). Through RMTP, ESDO has played a pivotal role in standardizing production, enhancing infrastructure, improving quality, and expanding market access—significantly boosting the capacity and competitiveness of the Thakurgaon cheese value chain.

Supporting Actors

Though not directly involved in cheese production, these actors play crucial roles in strengthening the overall ecosystem, particularly in enhancing milk quality, production efficiency, and market readiness. Their services indirectly but significantly impact the performance and sustainability of the cheese value chain in Thakurgaon.

- **Veterinarians and Health Service Providers:** These professionals ensure the health and productivity of dairy cattle, which is essential for maintaining a consistent supply of high-quality milk—an input critical to cheese production.
- **Cattle Feed, Silage, and Fodder Entrepreneurs:** By supplying nutritious and scientifically developed feed inputs, these actors support higher milk yield and better nutritional content, improving both quantity and quality for cheese factories.
- **Feed Companies:** These companies provide formulated cattle feed tailored to improve digestion and milk output. Their growing engagement with Goalas and farmers helps stabilize the raw milk supply chain.
- **Machine Suppliers and Mechanics:** These actors equip cheese producers with modern tools and technologies for milk chilling, cheese processing, cutting, sealing, and packaging. Access to mechanization has enhanced production efficiency**,** hygiene, and scale.
- **Packaging Vendors:** By offering food-grade and branded packaging solutions, these vendors enable producers to improve the presentation, shelf life, and market appeal of locally made cheese—supporting entry into retail and export channels.
- **Digital Marketers and Social Media Promoters:** As demand for cheese grows, some entrepreneurs are leveraging digital platforms and social media to market their products, tell brand stories, and reach urban consumers. This has opened up new sales channels and helped build a stronger market presence for Thakurgaon's cheese producers.

Together, these supporting actors are enabling **modernization, quality assurance, and better market visibility**, making Thakurgaon's cheese value chain more resilient, competitive, and future-ready.



2.3 Constraint Analysis

Prior to RMTP interventions, ESDO identified only 13 functioning cheese factories in Thakurgaon. A thorough assessment based on their production capacity, quality standards, and operational compliance revealed several systemic constraints. These constraints manifested as symptoms of market failure that collectively limited the growth, competitiveness, and sustainability of the cheese value chain in the region.

This analysis underscores how multiple, interrelated systemic constraints were holding back the cheese sector in Thakurgaon—ranging from skills and infrastructure gaps to market access and supply chain reliability. Through its market systems approach under RMTP, ESDO worked to resolve these foundational issues by addressing both the symptoms and root causes, thereby enabling a more resilient, inclusive, and high-performing cheese value chain.

Systemic Constraint 1:

Limited production capacity, infrastructure, and quality milk supply have restricted the scalability of cheese factories

One of the key systemic barriers limiting the growth of the cheese sector is the **inadequate production capacity and poor infrastructure** of many rural cheese factories. Most enterprises were operating at **suboptimal levels**, unable to meet the rising demand for cheese in both urban and international markets. A primary reason for this was the **lack of investment in modern machinery**—many factories relied on **manual processing systems** that were labor-intensive, time-consuming, and inefficient for scaling operations.

In addition, **space constraints** and the absence of **cold storage and freezing facilities** posed significant challenges. During periods of high milk availability, factories often failed to store surplus cheese properly, leading to product spoilage and economic loss. This also limited their ability to respond to fluctuating market demands or explore bulk contracts with larger buyers.

Compounding the issue was the **inconsistent and fragmented milk supply**. Many factories did not have formal procurement relationships with dairy farmers, cooperatives, or milk collectors (goalas). Instead, they relied on irregular, informal channels, which led to frequent **production delays and quality inconsistencies**. In areas without organized collection points or chilling infrastructure, milk quality was often compromised by the time it reached processing facilities.

Together, these limitations hindered the scalability and reliability of cheese production, preventing many promising enterprises from achieving commercial sustainability or entering larger, high-value markets. Addressing these constraints through investment, formal supply chains, and infrastructure development is essential for sector-wide growth.

Systemic Constraint 2:

The absence of structured training and business knowledge has limited the technical and entrepreneurial capacity of cheese producers

A critical barrier to quality and efficiency in the cheese sector was the **absence of structured technical training** for both entrepreneurs and factory workers. Most individuals involved in cheese production had no formal education or certification in dairy processing, food safety, or business management.

Instead, their knowledge was acquired through **informal apprenticeship models**, learning by doing or by observing others. While this hands-on approach fostered basic skills, it lacked the **scientific foundation and standardized practices** needed for consistent, high-quality production.

Without access to **systematic training that combined theoretical knowledge with practical application**, many factories operated with **inconsistent processes**, especially in areas such as pasteurization, curd formation, and packaging. One of the most common issues was **excess moisture in the final product**, which not only reduced shelf life but also compromised customer satisfaction and limited opportunities for bulk sales and export.

Moreover, the **lack of entrepreneurship development support** further hindered factory owners from making sound business decisions, managing operational risks, or planning for market expansion. Without foundational skills in financial management, marketing, and strategic planning, many entrepreneurs remained confined to small-scale operations, unable to scale or access formal markets.

Systemic Constraint 3:

Inadequate hygiene practices and unsafe working conditions have undermined food safety and worker well-being

A major constraint in the cheese sector was the **lack of proper hygiene and sanitation practices** in production facilities. Many factories did not follow **structured cleaning routines**, lacked designated clean zones, and did not enforce the regular use of **protective equipment** such as gloves, aprons, masks, and caps. Basic infrastructure to support hygiene—such as clean water access, drainage systems, and handwashing stations—was often inadequate or absent.

In addition, workers frequently operated in **environments with limited occupational health and safety measures**. Poor ventilation, exposure to excessive moisture and heat, and the absence of training in **safe food handling practices** increased risks to both worker well-being and product safety.

The issue extended to **environmental management** as well. Most factories lacked proper systems for **whey water disposal**, a common by-product of cheese production. This wastewater was often dumped in open areas around factory premises, leading to **unpleasant odor, mosquito breeding, and localized pollution**, posing serious risks to both the environment and surrounding communities.

Systemic Constraint 4:

The lack of standardization and quality control has limited access to high-value markets

A critical barrier to market expansion for cheese factories—particularly small and medium-sized enterprises—was the **lack of formal product certification and standardization**. Most factories operated without approvals from regulatory bodies such as the **Bangladesh Standards and Testing Institution (BSTI)** or **ISO certification**, which are essential for entering **formal markets**, including super shops, institutional buyers, and export channels.

Without standardized benchmarks for **moisture content, fat concentration, texture, and shelf life**, cheese quality varied significantly from one batch to another. This inconsistency made it difficult to

build **trust with high-value buyers**, who often require uniformity, safety assurance, and traceability in their supply chains.

In addition, factories typically lacked **milk testing equipment** to evaluate **fat content, microbial load, or adulteration** at the input stage. Since milk quality directly influences the yield and quality of mozzarella cheese, this gap often resulted in subpar product output, further undermining market competitiveness.

The absence of certification and quality control mechanisms not only hindered market access but also limited opportunities for product branding, consumer confidence, and long-term growth.

Systemic Constraint 5:

Weak market linkages and limited access to finance have restricted the growth of smaller enterprises

A significant barrier for small and micro-scale cheese producers was their **limited access to reliable buyer networks**. While larger factories had established distribution channels in Dhaka and other major urban markets, smaller producers were often **confined to selling within local communities**, where market saturation quickly occurred. Without knowledge of how to reach institutional buyers, super shops, or regional distributors, many entrepreneurs struggled to grow beyond their immediate geographic area. This lack of market visibility discouraged further investment and **deterred new entrants** from joining the sector.

In parallel, many micro-entrepreneurs faced **serious challenges in accessing finance** to start or expand their cheese ventures. A combination of factors—including **low awareness of financial services**, **fear of formal borrowing**, limited financial literacy, and the **absence of loan products tailored to small agro-processors**—kept these businesses from achieving their growth potential. Without working capital or investment in improved machinery and packaging, small producers remained stuck in subsistence-level operations, unable to scale or compete with more established players.

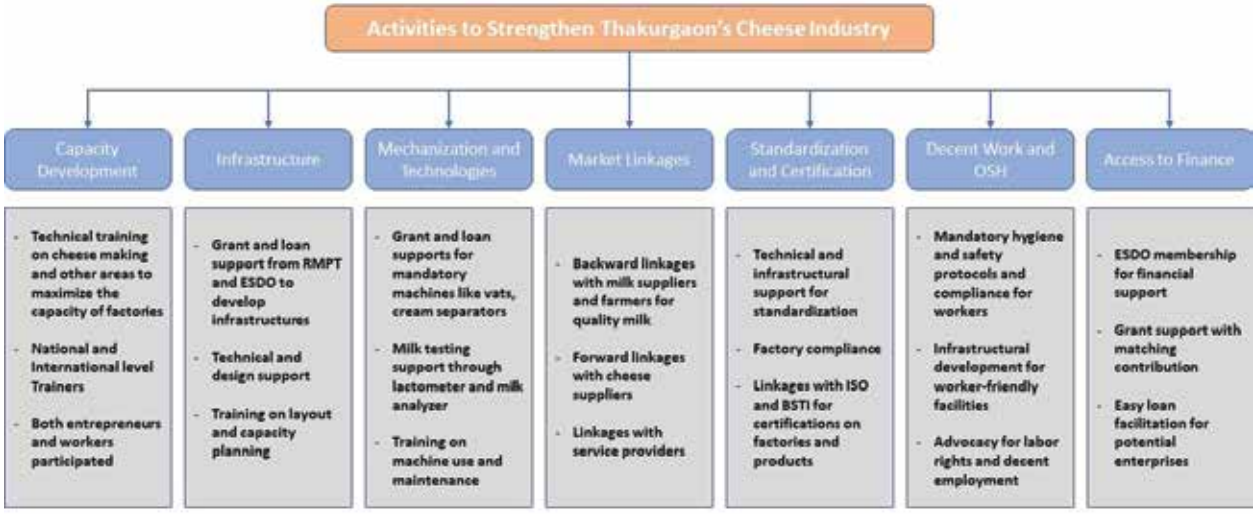
3 ASSESSMENTS OF RMTP INTERVENTIONS

3. Assessments of RMTP Interventions

3.1 Key Activities under RMTP Interventions

Based on the cheese value chain assessment conducted under Intervention-4 of RMTP, the study identified a set of core constraints that were limiting the growth, quality, and sustainability of cheese production in Thakurgaon. These constraints were categorized into five thematic areas, each representing a critical challenge faced by market actors across the value chain—from milk sourcing to end-market access.

To address these systemic issues, project interventions were strategically designed around these five themes. This alignment ensured a targeted and integrated approach to solving the root causes of underperformance in the sector. The seven key thematic intervention areas proposed through the study are outlined below.



3.1.1 Capacity Development

To address critical skill gaps in Thakurgaon's growing cheese industry, ESDO implemented a targeted capacity development initiative under RMTP. A total of 240 participants from 37 factories received hands-on training aimed at improving production quality, hygiene, and safety standards.

Training: to ensure high-quality instruction, ESDO engaged both international and national experts, including trainers from PUM Netherlands and Bangladesh Agricultural University. The training covered a wide range of technical areas, including cheese-making techniques, hygiene maintenance, fat and moisture control, whey reuse for ghee production, and safe use of chemicals.

Technical Development:

Participants were also trained on milk fat testing, cheese illustration checks, machine operation, and product consistency. Emphasis was placed on maintaining factory hygiene and workplace safety, equipping workers to meet quality standards and expand into formal markets.

Through this initiative, ESDO helped build a skilled, quality-conscious workforce—laying the foundation for a more competitive and sustainable cheese industry in the region.

3.1.2 Infrastructure

Figure 1 Pouring milk into a vat

Alongside capacity building, ESDO provided crucial infrastructural support under RMTP to strengthen cheese production facilities in Thakurgaon. This support came in two forms: financial and technical.

Financial: A total of 20 cheese entrepreneurs received grants ranging from 25% to 50% to purchase equipment and upgrade factory facilities. They were selected based on assessments of their business capacity and growth potential. Where additional investment was needed, ESDO also facilitated access to microcredit loans through its internal financing mechanisms.

Technical: many entrepreneurs lacked the knowledge to improve factory layout and capacity. ESDO worked closely with them to design or restructure facilities to optimize production, hygiene, and efficiency. Nearly all new factories established in the last three years relied on RMTP's guidance to develop their infrastructure in line with quality and operational standards.

This combined support enabled producers to modernize their operations, expand capacity, and meet the growing demand for locally made cheese.

3.1.3 Mechanization and Modern Technologies

Under RMTP, ESDO introduced modern machinery and technologies to enhance the efficiency, quality, and scale of cheese production in Thakurgaon. Entrepreneurs received financial support ranging from 25% to 50% to purchase essential machines, along with hands-on training on their proper use and maintenance.

Figure 2 Milk testing using milk analyzer

Figure 4 Tanker van for matha seller

Two of the most critical technologies introduced were the cheese vat—a basic requirement for production—and the cream separator, which enabled factories to convert whey water into ghee, adding value and reducing waste. Today, nearly all cheese factories in Thakurgaon are equipped with these two core machines.

In addition, several factories were provided with lactometers and milk analyzers to test fat and protein levels before processing, ensuring better consistency and quality. For enterprises with higher capacity, ESDO facilitated access to larger machines, such as boilers and vacuum packaging units, helping them scale up production and meet market demands more efficiently. These enterprises now maintain

equipment with their own resources, making the benefits long-lasting beyond project support. As production grows, many are opting to invest in advanced machinery even without grants, demonstrating a strong commitment to sustainability and long-term growth.

These technological upgrades have played a vital role in transforming Thakurgaon into a hub of semi-industrial, quality-driven cheese production.

3.1.4 Market Linkages (Backward and Forward)

To strengthen both input supply and product distribution, ESDO under RMTP focused on building robust market linkages for cheese factories in Thakurgaon.

Figure 3 Milk Collection

Figure 5 Production of Cheese

One major issue identified was the inconsistency in milk quality, as not all milk is suitable for cheese production. To resolve this, ESDO facilitated backward linkages between factories and reliable milk collectors and dairy farmers, ensuring a steady supply of high-quality milk and reducing production disruptions.

In addition, factories were connected to support service providers, such as machine repair technicians and packaging vendors, creating a more efficient and responsive local ecosystem.

On the forward market side, ESDO linked factories—especially smaller ones—with vendors and cheese suppliers operating in Dhaka and other urban centers, allowing them to reach high-demand markets. As a result, even small-scale producers are now supplying cheese to major cities. More notably, linkages are being developed to explore export opportunities, with some factories already exporting cheese to countries such as South Korea and Canada—marking an important step toward global market integration.

3.1.5 Standardization and Certification

To improve product quality and unlock access to formal and premium markets, ESDO prioritized standardization and certification as a key intervention under RMTP. The process began with helping cheese factories adopt standard operating procedures in production, hygiene, and packaging to ensure consistency and compliance.

Once basic standards were in place, ESDO facilitated certification processes by linking factory owners with relevant authorities such as BSTI and ISO certification bodies. As a result, 17 factories have already received ISO certification, and three cheese products and five ghee products have been awarded BSTI certification, with more currently undergoing the process.

Figure 4 Momtaz Food Industries Received ISO Certification

These achievements have significantly improved the credibility and marketability of Thakurgaon-produced cheese, enabling producers to compete in both domestic and international markets with greater confidence and traceability.

3.1.6 Decent Work Environment and Occupational Safety and Health (OSH)

Recognizing that worker safety and well-being are essential to sustainable enterprise growth, ESDO integrated decent work and OSH standards into its support for Thakurgaon's cheese sector under RMTP.

ESDO provided technical guidance and awareness to factory owners on maintaining a clean, safe, and worker-friendly environment. Practical support included the introduction and use of gloves, caps, and white uniforms, Punch machine for staff attendance, Dress changing room, Separate Laboratory room, Health Care facilities which not only improved hygiene but also ensured basic worker protection during cheese processing.

0In response to the high number of women employed in the sector, several factories have begun setting up resting areas and breastfeeding corners, making the workplace more inclusive and supportive. Some

Figure 5 Safe and Decent Work Environment for Workers

Enterprises are also adopting modern practices like fingerprint-based attendance systems, reflecting a shift toward more formal workforce management.

Beyond physical safety, ESDO has been advocating for fair labor practices, including decent wages, paid leave, employment policies, and clear terms for probation, termination, and grievance handling. The broader objective is to formalize the cheese sector by embedding labor rights and occupational standards, paving the way for long-term social and economic sustainability.

To ensure that cheese entrepreneurs can invest in their operations and scale sustainably, ESDO provided targeted financial support under RMTP through a combination of grants and loans.

3.1.7 Access to Finance

To ensure that cheese entrepreneurs can invest in their operations and scale sustainably, ESDO provided targeted financial support under RMTP through a combination of grants and loans.

To be eligible for this support, all participating factories were required to become members of ESDO, allowing them access to a wider range of services. Grants were primarily offered for purchasing machines, equipment, and infrastructure, but factories could also request support for working capital or other business needs. Importantly, these grants were not provided in full—ESDO assessed each factory's capacity and potential, and required a matching contribution from the owner to ensure commitment and promote financial discipline.

Figure 6 Beneficiary Received Loan from ESDO Branch Office

In parallel, ESDO offered flexible loans through its microcredit program. As registered members, factory owners could access financing for any business purpose. Today, almost all cheese factory owners in Thakurgaon have active loans with ESDO, using this capital to sustain and expand their operations.

3.2 Intervention Impacts

Summary of key impacts

The **Rural Microenterprise Transformation Project (RMTP)**, implemented by **ESDO**, has transformed Thakurgaon's cheese industry into a dynamic, semi-industrial sector with strong linkages across the dairy value chain. Starting with just 13 operational factories in 2022, the number has now grown to over 37, thanks to targeted support in **capacity building, infrastructure, mechanization**, and **access to finance**. Factories upgraded their daily processing capacity from 15,000–20,000 liters of milk to 35,000–40,000 liters, producing 4.3 tons of cheese per day.

Modern machines such as **cheese vats, cream separators**, and **milk analyzers** have improved productivity and food safety, replacing traditional manual processes. RMTP's push for **product diversification** has enabled producers to offer mozzarella, sliced cheese, cheddar, ghee, butter, matha, yogurt, and more—generating multiple income streams. By utilizing whey water to make ghee, producers also turned waste into profit.

Production increases have been achieved for **6,800 out of 8,000 dairy farmers** directly linked to cheese factories. In total, **22,000 out of 28,000 farmers** under RMTP interventions have reported **increased income**. The **price of milk has risen by BDT 5 per liter**, from **BDT 45 to BDT 50**, enhancing profitability across the supply chain.

Business profitability has surged, with monthly earnings ranging from **BDT 30,000 in cottage units to BDT 800,000 in large enterprises**. Employment has also expanded, with **245 workers—90% of them women—engaged in formal jobs** under safer and more inclusive working conditions. RMTP and ESDO's efforts on **gender inclusion**, including advocating for **breastfeeding corners and maternity leave**, have empowered women entrepreneurs and workers alike.

Export potential is growing, with **two factories exporting cheese to South Korea and Canada** through value-added partnerships. Domestically, the sector now **meets 75% of national cheese demand**, reducing import reliance.

Beyond factories, the impact is visible across the ecosystem: **dairy farmers enjoy better milk prices**, collectors have more stable cash flow, feed companies see rising demand, machine vendors are expanding, and restaurants are embracing cheese-based menus. **Financial institutions now view the sector as low-risk**, fueling further investment.

In sum, RMTP has created a model of **inclusive, sustainable rural industrialization** that uplifts producers, workers, and service providers alike.

3.2.1 Business Growth and Expansion

Rapid Increase in Operational Factories

When RMTP began its interventions in 2022, Thakurgaon had only 13 functioning cheese factories. These were small-scale, often informal setups with limited capacity and low-quality assurance. Today, the district hosts over 37 active cheese factories, many of which began operations within the last three years, directly supported by the RMTP project. This expansion was facilitated through capacity building, infrastructure support, and access to finance. ESDO also fostered a positive environment for new entrepreneurs by encouraging and mentoring potential investors, leading to healthy competition and innovation in the sector. Meanwhile, existing entrepreneurs received expansion support to upgrade and modernize their operations.

Improved Factory Capacity and Milk Utilization

Prior to the interventions, most factories processed between 20–50 liters of milk daily. Thakurgaon's total cheese processing previously required only 15,000–20,000 liters of milk daily. With RMTP's support, about 12 factories many now handle between 1,000 to 2,500 liters per day, with district-wide capacity reaching 35,000–40,000 liters daily, producing 4.345 tons of cheese.

Modernized Production and Mechanization

RMTP introduced essential modern machines such as cheese vats, cream separators, boilers, milk analyzers, and vacuum packaging units. Nearly all factories are now equipped with cheese vats and cream separators—fundamental tools for efficient cheese and ghee production. The use of lactometers and milk analyzers has enabled factories to assess input quality and produce consistent, high-quality cheese.

Beyond improving productivity, the introduction of technology also brought about important behavioral changes. For example, tasks that were once performed manually—like separating fat from milk by hand—are now done hygienically and efficiently using machines. This shift has reduced physical labor, improved food safety, and fostered a more professional production environment. These technological upgrades have collectively modernized the cheese-making process and enabled factories to scale their operations with confidence.

Product Diversification

Figure 7 Cheese Factories Producing Cheese and Selling Matha

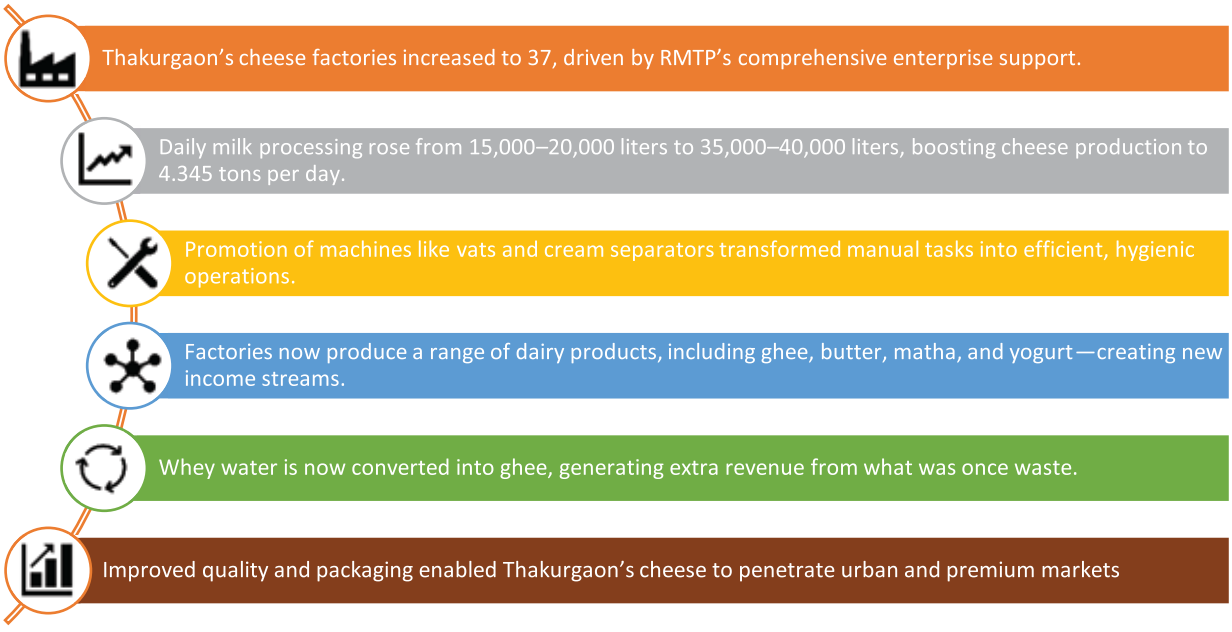
RMTP placed strong emphasis on product diversification to boost profitability and expand market reach. In addition to mozzarella, cheese factories in Thakurgaon are now producing sliced cheese, ricotta, cheddar, goat cheese, ghee, butter, ponir, matha, and yogurt. Each day, approximately 4,000 liters of milk are used for yogurt production and 1,200 liters for matha. Meanwhile, daily butter production has reached around 700 kilograms. This diversification has unlocked new revenue streams and firmly established Thakurgaon as a growing hub for a wide range of dairy products.

Utilization of Byproducts for Added Profitability

One of the most impactful changes introduced by RMTP was the utilization of whey water—a byproduct previously discarded as waste. Through training and the introduction of cream separators, factories now convert whey into ghee. For every 10 kg of cheese produced, approximately 1 kg of ghee is extracted, representing an entirely new revenue stream with minimal additional cost.

Market Expansion and Demand Growth

Due to improvements in quality, hygiene, and packaging, Thakurgaon's cheese is now widely accepted in high-end markets, including four- and five-star hotels like Radisson, Westin, and Sheraton, as well as pizza chain shops like Pizzaburg, Digger, and Pizza Inn, mostly through third-party suppliers. The local demand has surged, especially among restaurants and households. In addition, Dhaka and other urban markets are increasingly sourcing cheese from Thakurgaon. This rising demand has significantly improved factory profitability and incentivized further investment in quality and capacity.



3.2.2 Enhanced Profitability and Local Employment

Increased Incomes and Business Returns

The profitability of cheese enterprises in Thakurgaon has significantly improved as a result of targeted interventions under the RMTP. With the introduction of modern machinery, enhanced product quality, and improved market access, producers are now earning higher returns from the same volume of milk—a major boost to enterprise sustainability.

For instance, using 100 kg of milk (costing approximately BDT 4,500–5,000), a factory can produce 10–12 kg of cheese. After deducting production costs, each kilogram of cheese yields a net profit of BDT 60–100, amounting to BDT 600–1,200 in cheese profit alone per batch. Additionally, from the byproduct whey water, producers can extract about 1 kg of ghee, which sells for BDT 700–800. This raises the total profit from a single batch to approximately BDT 1,200–1,300.

Factory sizes vary from small cottage units to larger commercial enterprises, and accordingly, monthly profits range from BDT 30,000 to BDT 700,000–800,000. However, in the early stages, out of 13 factories, only 5–6 were earning regular profits, while most were struggling to survive due to low production volumes and minimal profit margins. These earnings are now often reinvested in expanding production capacity, improving facilities, and generating local employment, thereby contributing to a vibrant and resilient rural economy.

Employment Generation and Decent Work

Figure 8 Women Workers Are Predominating the Employment Market in Cheese Factories

The cheese industry in Thakurgaon has emerged as a significant driver of rural employment, offering stable job opportunities across a growing network of factories. Depending on their scale, each factory employs between 2 to 10 workers, with monthly salaries ranging from BDT 5,000 for entry-level positions to BDT 15,000–20,000 for experienced or supervisory staff. A total of 245 individuals are now directly employed in cheese factories, up from fewer than 150 when the project began. At that time, the highest

monthly salary offered was only BDT 10,000, reflecting the substantial progress in both employment volume and wage levels.

Most factories now operate in 8–9-hour shifts, with overtime pay provided for extended work hours. In response to RMTP's focus on decent employment and workplace safety, many enterprises have adopted basic Occupational Safety and Health (OSH) measures—including first-aid kits, protective clothing, gloves, masks, and improved ventilation systems.

In a move toward greater formalization, several factories have begun to introduce written employment policies, outlining clear provisions for wages, leave entitlements, termination procedures, and worker rights. These improvements mark a meaningful step toward building a more structured, equitable, and professional work environment within the rural agro-processing sector.

Women's Empowerment and Inclusion

Women are at the heart of Thakurgaon's cheese industry transformation, breaking barriers in a region traditionally marked by conservative gender norms. Out of the 37 operational cheese factories, 15 are owned and managed by women entrepreneurs—an unprecedented milestone that reflects the shifting dynamics of rural enterprise. The sector has created direct and indirect employment for over 245 individuals, with more than 90% of them being women.

A powerful example is Masuma Khanam, one of the earliest pioneers in the Thakurgaon cheese industry. Since establishing her factory in 2012, she has focused on inclusive employment, hiring abandoned, widowed, and socially excluded women—many of whom were previously considered unemployable. Her model has since inspired other entrepreneurs, demonstrating that women can lead not only on the production floor but also in business strategy and management.

These women, once confined by social norms, are now earning independently, managing operations, and training others. Their participation has improved household income, food security, and community perceptions around women's economic roles. RMTP has played a key role in promoting women's leadership, while ESDO's advocacy for policies like breastfeeding corners and maternity leave has helped establish a safe, supportive, and empowering work environment for their continued engagement and growth.

Monthly profits ranging from BDT 30,000 to 800,000 depending on scale

Each factory employs 2–10 workers with salaries between BDT 5,000–15,000

Over 90% of the cheese factory workers are women, with 15 factories led by women entrepreneurs

3.2.3 Emerging Export Potential

Building the Foundation through Standardization

Before RMTP's intervention, cheese factories in Thakurgaon lacked a standardized framework for production, hygiene, and quality control. ESDO, under RMTP, developed and implemented a unified production standard across all supported factories. This included good manufacturing practices (GMP), safe handling protocols, hygienic processing layouts, and consistent packaging systems. These foundational improvements laid the groundwork for quality assurance, helping factories produce cheese that could meet national and international expectations.

Strengthening Quality and Certification

Once production practices improved, RMTP facilitated the certification process for factories. A total of 17 factories received ISO certification, while eight specific products (five ghee and three cheese) earned BSTI certification. These certifications not only validated product quality but also enhanced buyer trust and unlocked access to premium markets. By achieving these standards, Thakurgaon's cheese producers positioned themselves competitively for domestic institutional buyers and overseas partners.

Figure 9 Masuma Khanam Receiving ISO Certification

Entry into the Global Supply Chain

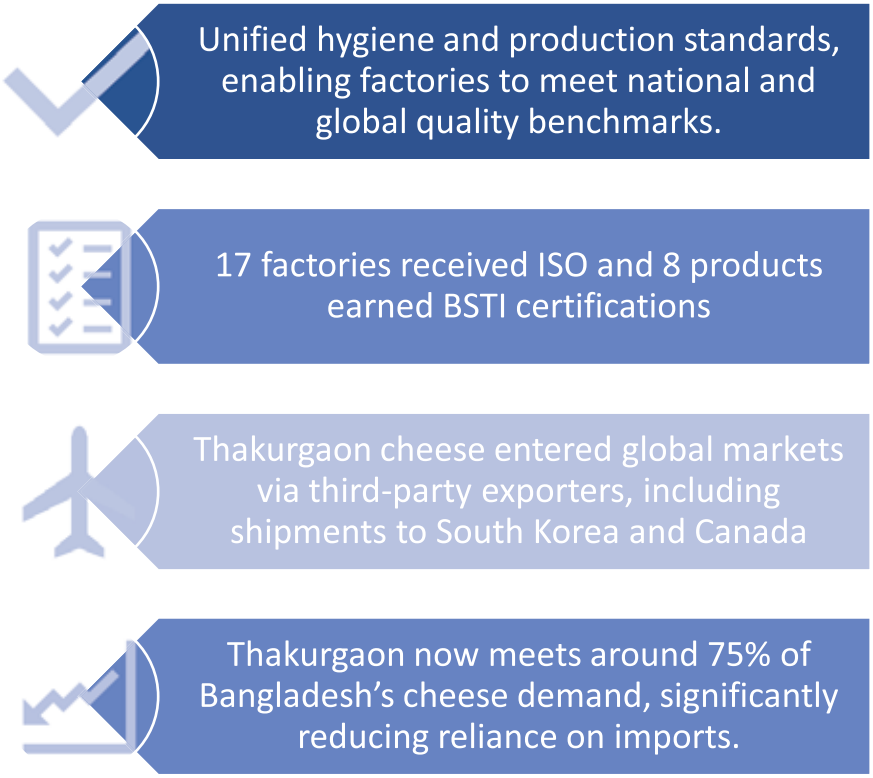
Thanks to improved quality, packaging, and food safety compliance, Thakurgaon-made cheese has entered the global market. Two factories—'Cheese land' and 'Thakurgaon Fresh Mozzarella Cheese'—are now exporting products to Canada and South Korea. While these factories are not directly licensed exporters, RMTP facilitated partnerships with third-party exporters to navigate regulatory requirements and access new markets. For instance, 'Thakurgaon Fresh Mozzarella Cheese' partnered with Total Food, a company that exports shrimp to South Korea. The mozzarella cheese is used as a value-added ingredient with shrimp, creating innovative fusion products for international consumers.

Advancing Export Readiness through Certification and Compliance

A growing number of cheese factories in Thakurgaon have secured ISO and BSTI certifications, enabling them to expand into formal retail markets and build consumer trust. Some enterprises have already begun exporting mozzarella cheese as a value-added product through strategic collaborations, successfully clearing international standards such as MFDS (South Korea) and CFIA (Canada). To deepen export capacity, ESDO under RMTP is now working with a select group of high-potential factories to help them obtain advanced certifications like HACCP, Halal, ERC, CO, and EU country-specific approvals. RMTP is also addressing key regulatory needs—such as factory compliance and storage infrastructure—and is establishing a central cold storage facility to support the entire cheese hub.

Reducing Import Dependency

Mozzarella and other cheeses, which were previously imported in large quantities to meet domestic demand, are now being produced locally at scale. Thanks to improved production capacity, mechanization, and adherence to quality standards, Thakurgaon alone is currently fulfilling around 75% of Bangladesh's total cheese requirement. This remarkable transformation has not only reduced the country's reliance on costly imports but also kept more economic value within the local supply chain. As a result, local enterprises are benefiting from increased market share, and the dairy sector as a whole is becoming more self-sufficient and resilient.



3.2.4 Advancing Environmental Sustainability

Whey Water Management and Ghee Production

Before RMTP's intervention, whey water—the byproduct of cheese-making—was commonly discarded into open fields, drains, or nearby water bodies. This unmanaged disposal practice led to foul odors, environmental pollution, and posed serious health risks for surrounding communities, including mosquito breeding and water contamination. Recognizing the urgency of the issue, RMTP introduced cream separators and provided hands-on training to entrepreneurs on whey processing and utilization techniques.

As a result, factories are now transforming this waste into a high-value product: ghee. For every 10 kg of cheese produced, approximately 1 kg of ghee can be extracted from whey—turning what was once a pollutant into a profitable income stream. This innovation has not only eliminated a major environmental hazard but has also boosted factory profitability, demonstrating that sustainability and business growth can go hand in hand. The approach offers a replicable model for environmentally sound and economically viable waste management in rural agro-processing sectors.

Cleaner and Safer Production Facilities

Ensuring sanitation and workplace hygiene was a core focus of the RMTP intervention. Recognizing the critical role of cleanliness in food safety and quality assurance, the project introduced structured cleaning protocols across cheese factories. These included the regular use of food-grade vinegar for disinfecting surfaces, as well as the establishment of zoned areas for different stages of production—such as milk reception, curdling, cutting, and packaging—to prevent cross-contamination.

Figure 10 International Experts Providing Training on International-Standard Cheese Production

To further enhance hygiene, workers were equipped with personal protective equipment (PPE) including gloves, white lab coats, head caps, and, in some cases, masks and shoe covers. These changes have significantly reduced the risk of contamination, creating cleaner, safer work environments for staff.

As a result, factories have seen noticeable improvements in both worker health and product quality—key prerequisites for accessing formal domestic markets and fulfilling export requirements. These hygiene upgrades not only ensure compliance with food safety standards but also build consumer trust in Thakurgaon's cheese as a high-quality, safe product.

Alignment with Municipalities

Although Thakurgaon municipalities initially lacked direct plans for managing cheese factory waste, RMTP actively engaged them to align waste disposal practices with existing municipal policies and protocols. Consultations were held prior to planning, ensuring local ownership and regulatory coherence. Moving forward, RMTP aims to formally collaborate with municipalities, so they can take over the monitoring and regulation of waste management systems once the project concludes, ensuring sustainability and compliance.

Energy and Resource Efficiency

The modern machines introduced—such as cheese vats, boilers, milk analyzers, and vacuum sealers—are not only more efficient in terms of output but also consume less electricity and water than traditional manual systems. By reducing reliance on physical labor and minimizing waste in production, factories have lowered their operational costs and carbon footprint. These energy-efficient upgrades have contributed to a more sustainable, semi-industrial cheese sector that aligns with both environmental and economic goals.

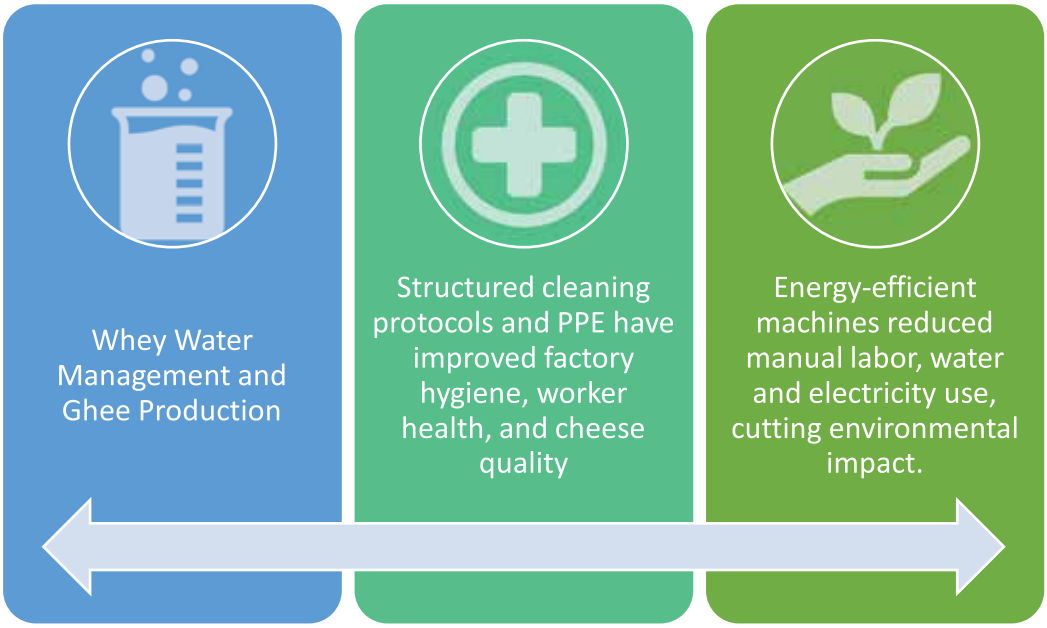


Figure 11 Goala Collecting Milk for Cheese Factories

3.2.5 Spillover Impacts across the Broader Dairy and Livestock Ecosystem

The systemic interventions of RMTP and ESDO in Thakurgaon's cheese sector have triggered wide-ranging benefits beyond the direct actors in cheese factories. From dairy farmers and milk collectors to equipment vendors and restaurants, a new, interconnected ecosystem is taking shape—driving income, employment, and innovation across the district.

a. Dairy Farmers: Rising Demand, Better Prices, and Improved Livelihoods



The expansion of the cheese industry has significantly boosted milk demand. While Thakurgaon's cheese sector once required just 15,000–20,000 liters of milk daily, this has now grown to 35,000–40,000 liters per day to meet the needs of 37 operational cheese factories.

This increase has allowed farmers to scale up production and invest more in their livestock. Importantly, the farmgate price of milk has increased from BDT 40-45 per liter to BDT 50–55, depending on fat content. This price shift is especially significant because it ensures that the gains from the sector's growth are shared upstream with producers. As a result, farmers have more income for household expenses, cattle feed, and healthcare, contributing to rural prosperity and resilience.

b. Milk Collectors and Chilling Centers: Volume Growth and Stable Cash Flow

Milk collectors (goalas) and chilling plants are among the biggest indirect beneficiaries. A collector who previously gathered about 500 liters of milk daily is now collecting 700–800 liters, thanks to increased demand from cheese factories. This represents a 20–25% increase in volume.

Unlike larger corporate buyers, cheese factories in Thakurgaon offer better prices—1 to 2 BDT more per liter—and more seamless cash transactions due to their local operations. This improved cash flow has enhanced the business stability of collectors and made them more responsive to farmers' needs, strengthening the entire supply chain.

c. Fodder, Silage, and Feed Suppliers: Surge in Demand for Specialized Nutrition

Figure 12 The Largest Silage Factory in Thakurgaon

Higher milk production requires more nutritious and regulated feeding. With rising demand for high-yield dairy cattle, feed producers and vendors have seen substantial growth. Local fodder and silage entrepreneurs, as well as national players like Nourish Feed and ACI Feed, have reported increased sales and a surge in demand for fat-enhancing, protein-rich feed.

Dealer networks are expanding, and new entrepreneurs are entering the market with localized feed solutions. This has created a thriving sub-sector focused on enhancing livestock productivity and supporting dairy-focused livelihoods.

d. Mechanization and Equipment Suppliers: Expanding Rural Markets

The cheese sector's mechanization drive has opened up a lucrative market for machinery suppliers in Thakurgaon. Companies like Trade Global Limited, which specialize in livestock mechanization, have reported a sharp rise in demand for cheese vats, cream separators, boilers, vacuum packaging machines, milk chillers, storage tanks, and cooling vans. Additionally, dairy-related farm tools such as feed mixers and fodder choppers are now widely adopted by local farmers. These developments have not only enhanced production efficiency at the factory level but also generated new business opportunities for equipment vendors, service technicians, and spare parts dealers—contributing to the growing industrialization of Thakurgaon's rural economy.

e. Packaging Vendors: Growth of Cheese Branding and Design

As factories began branding and marketing cheese products, the need for custom packaging emerged. RMTP supported these factories in developing professional labels and packaging concepts. This, in turn, led to the rise of local packaging vendors, who are now supplying durable, attractive, and safe cheese wrappers, boxes, and vacuum-seal options.

The sector has become an unexpected growth market for packaging designers and printers, offering new revenue streams and partnerships.

Figure 13 Successful Cheese Entrepreneur with His Own Branded Cheese

f. Restaurants: A Cheese-Inspired Culinary Transformation

Previously viewed as a luxury urban product, cheese is now a staple ingredient in Thakurgaon's restaurant scene. Local eateries have begun offering pizzas, pastas, burgers, and other cheese-based dishes—using locally made mozzarella and ricotta.

This shift has elevated the food culture in Thakurgaon and increased revenue for restaurants. As cheese availability and affordability grow, local culinary entrepreneurs are innovating and expanding their menus, helping turn Thakurgaon into a destination for cheese-based cuisine.

g. Financial Institutions: Growing Confidence in the Sector

With profitability proven and business models stabilized, financial institutions—especially microfinance providers and NGOs—are now actively investing in cheese enterprises. A total of 31 factory owners have availed loans through ESDO's microcredit scheme, and formal banks are also showing interest in financing cheese entrepreneurs.

This trend marks the financial formalization of the sector, providing entrepreneurs with the capital needed to upgrade operations, hire workers, and expand production. Cheese is now seen as a low-risk, high-return sector, making it a priority for local lenders.

Inclusive Industrialization

What began as an intervention in a niche product has now evolved into a multi-actor value chain transformation. The growth of Thakurgaon's cheese industry is not confined to factory walls—it has permeated the lives and businesses of farmers, service providers, vendors, financiers, and even restaurant owners.

By creating economic incentives, ensuring knowledge transfer, and fostering innovation, RMTP and ESDO have helped build a model for inclusive rural industrialization, where benefits cascade across the ecosystem and lay the groundwork for long-term, sustainable development.

3.3 Best Practices and Major Innovations

Best Practice 1: Tailored Support Through Capacity Assessment

At the start of the project, the RMTP team conducted a comprehensive assessment of all 13 existing cheese factories to understand their capacity and operational practices. The factories were categorized as A, B, or C based on compliance, quality, and productivity, and it was found that only four factories met the "A" category standards, while the rest faced significant compliance and capacity constraints. In response, RMTP designed tailored interventions and support packages for each factory, focusing on their specific needs for improvement. These ranged from providing equipment and training to introducing best practices in hygiene and production. The same approach was later applied when extending support to new factories, ensuring a structured and effective path to growth.

Best Practice 2: Shared Investment for Sustainability

Once the gaps were identified, the next challenge was ensuring factories had the facilities and met compliance standards, which required both technical and financial support. Since many owners lacked capital, RMTP offered grants covering 25–50% of equipment and infrastructure costs. To foster sustainability, these grants were always matched with an owner contribution, ensuring entrepreneurs had a stake in the investment. This approach created a sense of ownership and motivated factory owners to continue upgrading their facilities. In many cases, entrepreneurs quickly saw the benefits of the new equipment, such as cream separators and butter churners, and began making further investments on their own. This model of shared investment strengthened the resilience and long-term viability of the factories.

Best Practice 3: Investing in Knowledge and Expertise

The RMTP project recognized that Thakurgaon's cheese industry had deep-rooted potential but was unable to reach its full capacity due to technical and knowledge gaps. To address this, RMTP invested heavily in training, ensuring entrepreneurs and workers learned every aspect of modern cheese production. The project engaged international trainers from PUM Netherlands and national experts from Bangladesh Agricultural University (BAU), prioritizing quality and precision. Even today, entrepreneurs recall how these training sessions shaped their understanding of cheese making, providing the foundation for their growth and the long-term sustainability of the industry.

Best Practice 4: Ensuring Consistency in Milk Quality and Supply

RMTP recognized that a successful cheese industry depends on a consistent supply of quality milk. To make this happen, the project developed strong linkages between factories and farmers, creating a win–win situation: farmers gained access to better pricing, while factories secured high-quality milk with higher fat content. RMTP introduced milk analyzers and lactometers so factories could assess quality before collection, ensuring only the best inputs were used for cheese production. The project also worked closely with farmers, offering training and support to help them improve feed and cattle health, ultimately increasing the fat content and quality of their milk. This collaborative approach strengthened trust, improved efficiency, and laid a solid foundation for a sustainable and resilient cheese value chain.

Best Practice 5: Hygiene and Waste Management

Recognizing the critical role of hygiene in producing high-quality cheese, RMTP worked intensively with factories to implement structured sanitation protocols and waste management practices. The project introduced the use of food-grade vinegar for surface cleaning, enforced zoning within processing areas, and promoted the use of gloves, head caps, and white uniforms for workers. It also addressed waste disposal by introducing cream separators that turned whey water — previously discarded as waste — into valuable ghee. These measures significantly reduced environmental pollution and health hazards, making production cleaner, safer, and more efficient while strengthening the industry's reputation for quality and sustainability.

Best Practice 6: Mechanization Empowering Workers, Not Replacing Them

The RMTP introduced a range of modern machines in cheese factories, reducing manual handling and minimizing contamination and safety hazards for workers. Previously, hand-processing posed health risks and limited production capacity. These new machines did not replace the workforce — instead, workers were trained to operate them, gaining valuable technical skills and increasing their productivity. Today, factories have more trained staff working alongside equipment like cheese vats, cream separators, and vacuum packaging units. This approach has boosted production, improved quality, and enhanced worker safety, making the factories more efficient while ensuring that mechanization empowers rather than replaces the workforce.

Best Practice 7: Product Diversification for Stability and Growth

Although Thakurgaon is best known for mozzarella, RMTP introduced training and equipment for producing sliced, cheddar, and ricotta cheese as well. To expand their offerings, one factory received a mother goat to produce highly nutritious and valuable goat cheese. In addition, RMTP encouraged making matha, ghee, butter, and yogurt, allowing factories to utilize the same backward and forward linkages developed for mozzarella production. This approach reduced dependency on a single product, making

factories more resilient and adaptable, while maximizing their production potential and providing a more stable income stream across a diverse range of dairy products.

Best Practice 8: Branding and Certification for Market Sustainability

Before RMTP, most cheese products from Thakurgaon were delivered to restaurants through third parties, making it challenging for factories to build their own identity. RMTP encouraged factories to develop their own branding, focusing on packaging, labeling, and quality certifications. Today, 17 factories have achieved ISO certification, and 8 products have received BSTI accreditation, motivating others to upgrade their facilities and adhere to national quality standards. As a result, many factories are now attempting to supply their products directly to retail markets, including super shops and online platforms, gaining a loyal consumer base. This shift has established Thakurgaon as a recognized brand hub for mozzarella and other quality cheeses — no longer just an industry known to restaurants, but a trusted name for the public as well.

Best Practice 9: Decent Work, Policy Advocacy, and Employee Satisfaction

Through RMTP's interventions, significant improvements have been made in creating decent work environments across Thakurgaon's cheese factories. New facilities such as resting spaces, breastfeeding corners, first aid stations, and protective gear have fostered a sense of comfort, belonging, and safety for workers. Policy advocacy by ESDO has formalized work practices, introducing written policies on salaries, leave, termination, and rights. As a result, employees feel valued and satisfied, leading to lower turnover and stronger loyalty within the workforce. This sense of belonging has boosted efficiency and productivity, as trained and satisfied staff operate equipment more effectively and maintain higher quality standards. Together, these changes have laid the foundation for a more stable, productive, and employee-friendly cheese sector.

Best Practice 10: Collaboration with Public Agencies for Sustainable Growth

RMTP has strengthened collaboration with key public institutions to support the growth and sustainability of the cheese sector. The project maintains regular contact with BSTI and ISO authorities to streamline the certification process, ensuring quality and compliance. At the local level, the District and Upazila Livestock Offices (DLO and ULO) have embraced these best practices, focusing on improving milk quality and ruminant health so factories can reliably access premium raw materials. The Bangladesh Small and Cottage Industries Corporation (BSIC) has also been engaged to support small factories in formalizing their businesses. These collaborations foster shared ownership, aligning institutional priorities with the needs of cheese enterprises and reinforcing long-term sustainability and quality across the value chain.

3.4 Success Stories

Success Story 1-Masuma Khanam: The Pioneer of Cheese and Women's Empowerment in Thakurgaon

In the heart of Thakurgaon, the story of the district's cheese revolution would be incomplete without Masuma Khanam. A housewife from Nischintapur, Masuma became the sole breadwinner when her husband fell ill in 1982. After moving to Thakurgaon town, she tried several businesses before opening a cheese factory in 2012, following her eldest son's suggestion. Starting with just 27 liters of milk, her enterprise now processes 2,500 liters daily, generating an income of Tk1.80 lakh per month and employing 13 women and five men, many of them abandoned and helpless women.

Today, Masuma' 'Dimension Food' produces cheese, ghee, butter, paneer, and matha, using cream separators, butter churners, and cheddar cheese machines introduced with a 25% RMTP grant. Encouraged by her example, her children have established factories in Pabna, Bogura, and Thakurgaon, achieving ISO certifications and expanding their product lines.

A passionate advocate for women's empowerment, Masuma has inspired countless rural women to pursue careers and entrepreneurship. In recognition of her resilience and dedication, she received the Citi Foundation's "Best Small Entrepreneur" award in 2017. Today, her ISO-certified organization, supported by grants from both government and private institutions, stands as a beacon of progress and inclusion for rural entrepreneurs across Bangladesh.

Success Story 2-Refat Ullah: From Dhaka Job to Cheese Industry Leader in Thakurgaon

Refat Ullah is one of the most successful entrepreneurs reshaping the cheese industry in Thakurgaon. Before starting his own venture, he worked in Dhaka, but in 2018 he decided to return to Thakurgaon to build a business of his own. Inspired by his elder brother, who worked in a cheese factory, Refat started 'Best Yummy Mozzarella Cheese' and quickly scaled it into a thriving enterprise. Today, his factory processes 1,500 liters of milk daily, producing 150 kg of mozzarella and 15 kg of ghee.

Buying the best milk at Tk 50 per liter and checking its density with a lactometer, Refat ensures quality at every step. He operates with 13 vats and has mechanized production with cream separators, boilers, and vacuum machines, thanks to RMTP support. Training from PUM Netherlands further enhanced his skills and productivity.

With six employees, Refat now delivers cheese to Dhaka, Khulna, Dinajpur, and Bogura, both through third parties and direct sales to restaurants. Today, he earns a monthly profit of Tk 1.7–2 lakhs, making 'Best Yummy Mozzarella Cheese' a testament to rural entrepreneurship and the transformative potential of the RMTP project.

Success Story 3-Md. Habibur Rahman: From Cattle Farmer to Cheese Entrepreneur



Md. Habibur Rahman is a shining example of how entrepreneurs can thrive within a supportive ecosystem. Starting as a cattle farmer in 2005, he later became a Livestock Service Provider (LSP), offering AI support and dealing in veterinary medicines and vaccines. As his cattle farm grew, he began looking for ways to utilize his own milk effectively. RMTP encouraged him to venture into cheese production, providing technical guidance and grant support. This inspired Habibur to establish "Dui Bhai Mozzarella Cheese" in Pirganj Upazila, Thakurgaon.

Today, he processes around 1,400–1,500 liters of milk daily, including 200 liters from his own farm. Beginning with 11 vats, he embraced RMTP's introduced technologies, such as cream separators and milk analyzers, ensuring quality and precision. Habibur is committed to quality, testing milk and cheese illustrations himself.

With strong market linkages developed by RMTP, he now supplies mozzarella, ghee, and cream to Dhaka and other major cities. The factory, employing four staff—including one woman—operates under ISO certification and is expanding to include a laboratory and a breastfeeding corner for women. Habibur expects BSTI and international trade certifications soon. Today, after expenses, he earns Tk1.5–2 lakhs per month, making him an inspiring example of rural entrepreneurship and growth.

Success Story4-Thakurgaon Fresh Mozzarella: Leading the Way in Exporting Rural Cheese

To understand ESDO's contribution to Thakurgaon's cheese industry, one must visit Thakurgaon Fresh Mozzarella Cheese in Goreya Bazar. Founded by Mukta Akter and her husband, Shahidul Islam, this factory is a shining example of rural entrepreneurship reaching global markets. Mukta launched the business with a loan from ESDO, and with RMTP's technical and financial support, the factory has grown remarkably. At its peak, it processes roughly 2,000 liters of milk daily, producing 150–200 kg of mozzarella cheese and 15–20 kg of ghee. The best quality milk, purchased at Tk 50–52 per liter, is checked meticulously using lactometers, ensuring consistency and premium standards.

With nine vats and equipment such as cream separators and molding machines, introduced with RMTP's 25% grant support, the factory operates efficiently and hygienically. Today, it employs seven women and delivers mozzarella to renowned restaurants across Dhaka. What truly sets this enterprise apart is its breakthrough into the global market, exporting mozzarella cheese to South Korea and China — a remarkable feat for a rural factory.

Today, Mukta and Shahidul are seeking an international trade certificate to enable direct export, further expanding their global reach. After covering all expenses, the enterprise earns an impressive Tk3.5–4 lakhs in profits every month. What truly sets them apart is their collaborative approach — despite being successful entrepreneurs, they openly support new factories, sharing knowledge and experience with others, putting collective growth above competition. In many ways, their story captures the essence of ESDO and RMTP's vision for rural enterprise, inclusion, and sustainable economic development.

3.5 Challenges and Way Forward

3.5.1 Challenges

Challenge 1: Maintaining Consistent Milk Quality

One of the biggest challenges for the cheese industry is maintaining a consistent quality of milk, as it must have the right levels of fat and purity to produce premium cheese. Even slight contamination or inconsistency can ruin an entire batch, forcing factories to discard the milk and bear the loss. Despite using lactometers and milk analyzers to test inputs, many factories still struggle to fully control quality due to variations at the source. This highlights the critical need for improved milk collection, handling, and quality monitoring throughout the supply chain for sustainable cheese production.

Challenge 2: Limited Freezing Capacity during Peak Milk Season

Another critical challenge is the limited freezing capacity of small cheese factories. During summer, milk supply is abundant, but market demand for cheese is relatively low, forcing factories to produce surplus and freeze it for later sales. Small entrepreneurs, lacking adequate cold storage facilities, often struggle to preserve their products effectively, sometimes selling cheese at lower prices to manage excess stock. Yet, to maintain strong ties with milk suppliers, they must continue buying milk despite these constraints, highlighting the pressing need for improved storage and processing infrastructure.

Challenge 3: Dependence on Middlemen and Limited Pricing Power

A persistent challenge for cheese factories is their dependence on middlemen for both sourcing milk and selling finished products. While not all middlemen are unfair, this structure often leads to discrimination in profits and delays in payments, making it difficult for factories to secure fair pricing and maintain smooth cash flow. The reliance on intermediaries creates bottlenecks that hamper profitability and growth, limiting factories' ability to operate efficiently and sustain themselves in the long run. Addressing this issue is vital for building a more direct, transparent, and equitable supply and sales channel.

Challenge 4: Managing Whey Byproducts and Environmental Impact

Although RMTP introduced ghee production from whey water, which many factories have embraced, a significant portion of the byproduct still goes to waste. This leftover liquid is often discarded, causing strong odors and environmental pollution, especially for smaller and cottage-sized factories with limited space and resources. Yet globally, this byproduct can be used in many ways — from making protein drinks, animal feed, and bio-fertilizers, to extracting lactose and other valuable nutrients. Without proper waste management methods, these factories struggle to operate sustainably and hygienically, posing long-term environmental and health risks.

Challenge 5: Bridging the Gap in Standardization and Certification

While RMTP has significantly advanced standardization within the sector, many smaller factories still struggle to meet the requirements for ISO and BSTI certifications. Despite 17

factories achieving ISO status, BSTI approvals remain limited, making it challenging for others to access formal and premium markets. Without these certifications, smaller factories risk being left behind, unable to compete or expand their market reach.

Challenge 6: Limited Branding and Market Independence

Although many factories have entered the market, most do so through third-party suppliers, making it challenging for them to build their own brand identity. Their focus remains largely on production, with limited attention to marketing, branding, or direct connections with retailers. As a result, their products often circulate under others' labels, limiting their visibility and long-term growth. To thrive in competitive markets, these factories need support to develop their own branding, establish direct distribution channels, and secure a stronger, more independent presence — ensuring sustainability and greater market recognition for their products.

Challenge 7: Competition from Large Dairy Companies

The entry of large dairy companies into the cheese market is creating serious pressure on smaller RMTP-supported factories. These big players often have much larger production capacities and more advanced facilities, allowing them to benefit from economies of scale. In some cases, they intentionally lower their prices to undercut smaller competitors, making it challenging for smaller factories to sustain their businesses. This aggressive pricing and competitive advantage put smaller firms at risk of being pushed out of the market altogether, creating an existential crisis for them.

Challenge 8: Keeping Pace with Advanced Mechanization

Although RMTP-supported factories have made significant progress in mechanization over the years, technological advances in cheese production are reshaping the industry at an accelerating rate. New equipment — such as high-capacity vats that can process larger volumes of milk and fully automated cheese-making machines that minimize manual handling — are becoming increasingly common. These state-of-the-art machines can handle critical steps like curd cutting, stretching, molding, and even automated packaging, resulting in a more streamlined process that improves both production efficiency and product quality. However, these technologies come with a steep price tag, making them largely out of reach for smaller and medium-sized factories. As a result, many RMTP-supported factories risk falling behind, unable to invest in the equipment needed to stay competitive. In an industry that is quickly moving towards automation and precision, the gap between well-funded large operators and smaller firms is only widening, posing a serious threat to their long-term sustainability, at least in the international market.

Challenge 9: Limited Access to Capital

Small and cottage-sized cheese factories often operate with very limited cash capital, making it challenging for them to upgrade equipment, expand production, or adopt higher quality standards. Without adequate financing, these businesses struggle to keep pace with advances in mechanization and automation. As a result, they remain reliant on outdated methods, unable to compete effectively with larger, better-funded firms. This lack of investment threatens their long-term growth, sustainability, and overall market position.

3.5.2 Recommendations and Strategic Actions

Recommendation 1: Should Strengthen Milk Quality at the Source

Improving the quality of milk must begin at the farmer level. Targeted awareness programs should educate farmers and goalas (milk collectors) about best practices for maintaining and preserving milk quality, including proper handling, hygiene, and segregation of higher-quality milk. To support this, investments should be made in expanding access to chilling facilities and introducing modern equipment, such as transport cans and milk tankers, to maintain cold chains and reduce spoilage. Additionally, goalas must be trained to ensure that higher-quality milk is kept separate from lower-quality supplies, preserving its value throughout the supply chain.

Recommendation 2: Need to Establish Centralized Cold Storage and Market Linkages

While RMTP has already been making efforts in this area, a centralized or community-based cold storage facility or freezing center should be established. This facility would allow factory owners to securely store their cheese and manage sales more strategically, especially during periods of lower demand. A minimal storage fee can be introduced to cover operational costs. In parallel, more robust market linkages should be developed to help factories expand their sales beyond peak seasons, ensuring a more stable income stream and reducing vulnerability to market fluctuations.

Recommendation 3: Must Reduce Middlemen Dominance and Ensure Fair Pricing

To reduce the dominance of middlemen in the supply chain, direct connections between factories and retailers should be established, allowing factories to build their own distribution channels. In parallel, a pricing standard should be developed in consultation with middlemen and other value-chain actors, ensuring transparency and fairness across the supply chain. This approach will foster more equitable pricing, improve cash flow for small factories, and create a more sustainable and balanced market environment for all stakeholders.

Recommendation 4: Should Utilize Whey and by-Products for Added Value

Beyond producing ghee, factories should be trained and supported to utilize the leftover whey (white water) for creating other value-added products such as protein drinks, ricotta or paneer-style cheese, yogurt, or animal feed supplements. This requires targeted knowledge sharing, training, and technical support for small and cottage-sized factories, as well as the establishment and development of dedicated markets for these by-products. In parallel, small factories should be supported with waste management solutions to reduce environmental impacts, optimize resource utilization, and create new income opportunities from these valuable side streams.

Recommendation 5: Increase Facilitating Certification and Export Readiness

BSTI and ISO certification processes should be further facilitated, especially for smaller factories that struggle to access these standards. Targeted incentives and loan programs should be introduced to help factories cover the cost of obtaining these certifications. In parallel, factories that are already producing export-quality cheese should be supported in securing necessary trade facilities and licenses — such as Export Registration Certificate (ERC), Import Registration Certificate (IRC), Food Export Certificate, and Halal or other relevant certifications — to enable them to tap into international markets and expand their customer base.

Recommendation 6: Must Strengthen Marketing and Branding Capabilities

In addition to focusing on production and processing, factories must recognize the critical role of marketing and branding in expanding their market presence. Currently, only a handful of larger factories employ dedicated marketing personnel, while smaller ones often lack this focus. Making marketing an integral part of every factory's business model is essential for long-term growth. This can be achieved by enhancing branding through attractive packaging, targeted advertisements, and active promotion on platforms such as Facebook and other social media. In parallel, factories can build online sales channels and utilize courier services to deliver directly to retailers and household customers, tapping into the largely unexplored online marketplace and gaining a competitive edge.

Recommendation 7: Establish Positioning Through Quality and Collective Branding

To compete with larger dairy firms, small and medium-sized factories in Thakurgaon must focus on producing distinctive, high-quality cheese that sets them apart in the market. Instead of producing ordinary products, they should emphasize quality as a unique selling point, making it challenging for larger competitors to displace them. In addition, collective marketing and joint branding efforts can help Thakurgaon's cheese establish a strong market identity. To protect smaller factories from market manipulation, relevant public agencies should be engaged to implement price regulations and ensure a fair competitive environment, preventing dominant firms from engineering the market to force smaller players out.

Recommendation 8: Increase Facilitating Access to Advanced Technologies

To enable small and medium-sized factories to keep up with advances in automation and mechanization, targeted technical and financial support must be made available. Training programs should be introduced to familiarize factory owners and staff with automated production, packaging, and quality control technologies. In parallel, the project and government can collaborate to provide subsidies and incentives for equipment purchases, while also supporting local manufacturing of such machinery. By making advanced equipment more accessible and affordable, small factories can modernize their operations and remain competitive in an increasingly technology-driven industry.

Recommendation 9: Should Encourage Investment through Loans and Flexible Credit

The growth and advancement of factories should not rely solely on grants and external support. Instead, businesses must be encouraged to access loans as a means to build long-term sustainability. This approach has a dual benefit: it allows factories to invest more in infrastructure and technology, and it strengthens their motivation to utilize those investments efficiently for growth. ESDO can play a pivotal role by introducing more flexible loan products through its microcredit program, while other financial institutions — including banks, NBFIs, and asset-based financing firms — can be engaged to create tailored financing options that support the sector's evolving needs.

Recommendation 10: Must Establish a Cheese Industry Association

Since RMTP will not be present forever, it is crucial to create a dedicated association or central body for the cheese industry. This platform should be market-led, with active participation from cheese factories, suppliers, and other stakeholders. It can serve as a space for sharing knowledge, best practices, and

resources to support the collective growth of the sector. Importantly, it can also play a pivotal role in setting and upholding pricing and quality standards, ensuring that no player can manipulate the market at the expense of smaller factories and promoting a fair, sustainable environment for all.

Recommendation 11: Enhance Promotion and Awareness of the Cheese Industry

More focused promotional and branding activities should be undertaken to highlight the growth and potential of the cheese sector. This can include creating digital and printed materials that document the industry's evolution, showcase its products, and build a strong, recognizable brand for Thakurgaon cheese. Additionally, organizing exhibitions, fairs, and tasting events can give customers, retailers, and stakeholders the opportunity to experience the products firsthand, increasing market visibility, boosting consumer trust, and attracting new business opportunities.

4 CONCLUSION

4. Conclusion

The **Rural Microenterprise Transformation Project (RMTP)** has ushered in a profound and lasting transformation in the cheese sector of Thakurgaon, reshaping it from a fragmented, low-capacity industry into a dynamic, semi-industrial powerhouse. By focusing on every link of the value chain — from raw milk supply and processing to mechanization, quality improvement, market linkages, and access to finance — RMTP laid a strong foundation for sustainable growth, resilience, and inclusivity.

Through targeted interventions in capacity development, RMTP built a highly skilled workforce proficient in best practices for cheese making, hygiene, equipment handling, and quality control. The project introduced critical infrastructure and modern equipment — such as cheese vats, cream separators, lactometers, and vacuum packaging units — allowing factories to optimize their production, reduce waste, and expand their product offerings. What started with a handful of factories has now evolved into an industry of over **37 operational units**, producing a diverse range of products including mozzarella, cheddar, sliced cheese, ghee, butter, yogurt, and matha.

Importantly, RMTP strengthened backward linkages by supporting farmers and milk collectors with training, quality assessments, and improved pricing, fostering trust and ensuring a consistent supply of high-quality milk. **More than 28,000 farmers have benefited from the project overall**, with **6,585 farmers directly engaged with cheese factories**, reaping the benefits of the expanding cheese industry. At the same time, the project worked to establish forward linkages, connecting factories with retailers and institutional buyers in Dhaka and other urban centers, and facilitating access to international markets. **Exports to countries like South Korea and Canada** now stand as a testament to the global potential of this growing sector.

Through its emphasis on quality standards and certifications, RMTP supported factories in achieving **BSTI and ISO certifications**, making Thakurgaon cheese competitive nationally and internationally. Its focus on decent working environments, gender inclusion, and occupational safety has created a more productive and equitable workforce. To date, the project has contributed to the creation of **over 6,500 jobs** across the value chain — including in factories, milk production, cattle farming, milk collection, and other related sectors.

Meanwhile, RMTP's strategic partnerships further amplified its impact. **Private sector collaborations** were formalized through MoUs with key companies such as **Trade Global Limited (farm mechanization)**, **mPower (ICT solutions)**, **Nourish Feed Company (cattle feed)**, and **BRAC (livestock services including AI)**. **Public sector engagement** was also pivotal, with strong cooperation from the **Department of Livestock (DLO)**, **Upazila Livestock Offices (ULO)**, **BSCIC**, and **local municipalities**, aligning policy support and service delivery with sectoral needs.

Today, the Thakurgaon cheese sector serves as a beacon of inclusive rural industrialization — a model that can be replicated across Bangladesh and beyond. RMTP has demonstrated how a holistic, market-driven approach can transform rural enterprises into resilient, quality-oriented, and sustainable industries, providing improved incomes, safer working conditions, and long-term growth for entrepreneurs, workers, and farming communities alike.

5 ANNEXURES

5. Annexures

Annexure-1 List of ISO Certified Factories

Sl No.	Factories Name	Owner Name	ISO Certification
1.	Dimension Cheese Factory	Masuma Khanam	Done
2.	Best Yammi Cheese	Md. Rifatullah	Done
3.	Cheese Land	Md. Jahangir alam	Done
4.	Cheese Gallery	Md. Jahir Uddin	Done
5.	Milk Man Dairy	Md. Nure Alam	Done
6.	Eminent Agro	Nagina Naznin Keya	Done
7.	Thakurgaon Fresh Mozzarella Cheese	Mst. Mukta Akter	Done
8	Momotaz Food Products	Rashida Khatun	Done
9	KMH Food Products	Mst.Shefali Aktar	Done
10	Tamim Mozzarella Cheese	Mst. Mira Akter	Done
11	Rained Cheese Factory	Tonmoy ray	Done
12	Palli Shoa Fresh Mozzarella Cheese	Md. Jakir Islam	Done
13	Khan Dairy & Food Products	Md. Shorab Uddin	Done
14	M/S Dui Bhai Mozzarella Cheese	Md. Habibur Rahman	Done
15	Komlesh Dairy Products	Komolesh	Done
16	ESDF	ESDF	Done
17	RP Mozzarella Cheese	Md. Azad Parvej	Done

Rmtp

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