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Evaluating the Growth of MSMEs within Industrial Infrastructures: Insights from Assam, India

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ABSTRACT

This study evaluates the performance and growth patterns of 227 Micro-Small and Medium Enterprises (MSMEs) operating within industrial infrastructures in Assam, specifically focusing on the Kamrup and Kamrup Metro districts during the period 2017–2022. By analyzing key indicators such as investment, employment, profitability, and sales trends, the research identifies both opportunities and challenges faced by these enterprises. The results show a decline in employment, especially male employees and unskilled labour force, which indicates the structural problems prevailing in the employment. Investment in capital assets such as plant and machinery has decreased over the years, while working capital investments have remained stable, highlighting a prioritization of liquidity. Profitability trends show stable gross profits but shrinking net margins, largely due to rising operational costs. Domestic sales have grown steadily, but the absence of international sales underscores missed export opportunities. The study highlights the crucial role of industrial infrastructure in facilitating MSME growth through improved access to essential services, proximity to markets, and logistical advantages. However, challenges such as inadequate infrastructure maintenance, policy inefficiencies, and limited technological support hinder the sector's long-term growth potential. To address these challenges, the study provides policy recommendations aimed at enhancing infrastructure quality, expanding market access, and fostering sustainable business practices to ensure the success and resilience of MSMEs.

Keywords: MSMEs, Industrial Infrastructure, Investment Trends, Employment Generation

JEL Classifications: L52, L26, O14, O25, R58

1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are integral to economic growth and sustainability worldwide. They generate employment, reduce poverty, and contribute significantly to industrial output and exports. Across countries, MSMEs act as engines of inclusive growth, fostering entrepreneurship, and promoting regional balance (Arifin et al., 2021). In India, the MSME sector has emerged as a cornerstone of the economy, accounting for around 30% of the national GDP and 45% of total industrial output (MVIRDC World Trade Center Mumbai, 2024). These enterprises play a crucial role in achieving India's developmental goals, including rural industrialization, balanced regional growth, and poverty reduction.

Given the significance of the MSME sector, India's MSMEs provide employment to approximately 111 million people, comprising 40% of the workforce and producing over 6,000 products for both domestic and international markets (Kumar, 2017). The Ministry of Micro, Small, and Medium Enterprises classifies MSMEs based on investment and annual turnover. As per the latest classification (2020), micro enterprises are businesses with an investment of up to ₹1 crore and a turnover of up to ₹5 crores. Small enterprises include those with investments up to ₹10 crores and turnover up to ₹50 crores, while medium enterprises involve investments up to ₹50 crores and turnover up to ₹250 crores. This classification reflects the varied scale of operations and diverse nature of businesses within the sector, covering both manufacturing and service enterprises. The MSME sector plays a pivotal role in reducing income disparities

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by absorbing surplus rural labour and fostering rural development (Vinila, 2022). Initiatives such as the Khadi and Village Industries Programme (KVIP) have been instrumental in reviving traditional industries, empowering marginalized communities, and promoting economic inclusivity (Kiss and Zagyi,2014). However, despite this potential, the sector faces challenges related to infrastructure, access to finance, and competition from larger firms (Gaikwad and Dhokare, 2020).

To address these challenges, initiatives like Make in India and the National Manufacturing Policy aim to boost MSME contributions to 25% of GDP by encouraging investments in manufacturing (Zanjurne, 2018). Complementary programs, such as the MSMED Act of 2006 and the Trade Receivables Discounting System (TReDS), enhance credit accessibility for MSMEs (Vinila, 2022). With MSMEs contributing 45% to total exports, their performance is essential for India's economic stability (MVIRDC World Trade Center Mumbai, 2024). However, credit challenges persist, with an estimated credit gap of ₹20-25 trillion, restricting many MSMEs' ability to grow (MVIRDC World Trade Center Mumbai, 2024).

The financial constraints faced by MSMEs are further highlighted by international comparisons. In India, only 6% of outstanding loans are directed toward MSMEs, compared to 46.3% in China and 46% in South Korea (MVIRDC World Trade Center Mumbai, 2024). This gap in formal financing is exacerbated by rising raw material costs and operational challenges associated with Goods and Services Tax (GST) compliance (Kumar, 2017). Recognizing these barriers, the Reserve Bank of India (RBI) has implemented restructuring schemes and digital financing platforms, such as TReDS, to enhance credit access. Additionally, government policies like Aatmanirbhar Bharat aim to make MSMEs more self-reliant by improving credit facilitation and promoting exports (Vinila, 2022).

While these national-level initiatives provide crucial insights, it is equally important to explore how MSMEs operate within regional contexts, where infrastructure and local conditions play a decisive role. The Northeast region of India holds immense strategic significance for the nation, both economically and geographically. It serves as a gateway to Southeast Asia under the Act East Policy, facilitating cross-border trade and regional cooperation. Assam, located at the heart of the Northeast, plays a pivotal role in regional development due to its connectivity, natural resources, and cultural heritage. Specifically, Guwahati, the business hub of the Northeast, acts as a critical node, connecting Assam with the rest of India and neighbouring countries.

Within Assam, Kamrup and Kamrup Metro districts host the highest number of MSMEs, making the state an ideal focus to assess how industrial infrastructure influences MSME performance. Understanding the dynamics of MSME growth in Assam, particularly in these two districts, provides insights not only into the regional economy but also into the national agenda of fostering inclusive development in frontier regions. With its unique concentration of MSMEs and proximity to Guwahati, Assam exemplifies both the opportunities and challenges associated with industrial infrastructure in remote but strategically important areas.

In Assam, MSMEs comprise approximately 95% of the total industrial units (Government of Assam, 2020). These enterprises are not only significant for industrial output but also serve as the second-largest provider of employment, following agriculture. Notably, 90% of MSME entrepreneurs are first-generation business owners, underscoring the sector's role in fostering entrepreneurship and promoting inclusivity. Assam's 4,538 factories are predominantly distributed across micro (70%), small (20%), and medium (10%) enterprises. The unorganized sector, with 3,70,781 enterprises employing 6.5 lakh people, is largely rural-based, with 90% operating in rural areas, which contributes to rural development and economic decentralization (Directorate of Economics and Statistics, Government of Assam, 2017–2022).

This focus on Assam is essential because the region's MSMEs face distinctive challenges that reflect the difficulties experienced across India, but with added regional complexities. Access to finance remains a persistent issue, as these units heavily rely on bank loans, making them vulnerable to financial disruptions. Additionally, delays in debtor payments create working capital stress, limiting the ability of businesses to maintain smooth operations. Compounding these issues, many industries operating in Assam are controlled by head offices outside the state, resulting in delays in decision-making and operational challenges.

The choice of Kamrup and Kamrup Metro districts further enhances the relevance of this study. These districts have been selected not only because of their high concentration of MSMEs but also due to their proximity to Guwahati, which offers easier access to markets, suppliers, and infrastructure. This proximity allows the study to assess how well-positioned MSMEs can leverage their strategic location to overcome operational challenges. Understanding the dynamics of MSME growth within these industrial infrastructures will provide insights into how targeted policy interventions can enhance the sector's performance and resilience.

1.1. Industrial Infrastructure and the Focus on MSMEs

For the purpose of this study, industrial infrastructure refers to organized facilities such as industrial areas, estates, growth centres, food parks, and mini -industrial estates that provide essential support for business operations. These infrastructures are designed to offer access to land, utilities, transport, and other services, creating an enabling environment for enterprises to grow and sustain operations. The presence of such infrastructures plays a crucial role in reducing operational costs, fostering collaboration among enterprises, and enhancing productivity.

The decision to focus on MSMEs operating within industrial infrastructures is based on the recognition that these enterprises have distinct advantages over others. MSMEs within such setups are better positioned to leverage shared resources and infrastructure, enjoy proximity to suppliers and markets, and often have easier access to institutional support through government schemes and policies. However, these advantages come with unique challenges, such as infrastructure maintenance issues, bureaucratic delays, and competition for shared resources. Given the significance of MSMEs for economic growth, evaluating

their performance within industrial infrastructures offers valuable insights into how well these setups support entrepreneurship and economic resilience.

Given the concentration of MSMEs in Kamrup and Kamrup Metro districts and their proximity to Guwahati, the region offers a unique opportunity to study how industrial infrastructure supports MSME growth and resilience. Targeted policy interventions based on these insights could significantly enhance the sector's performance and sustainability.

1.2. Objectives of the Study

This research aims to evaluate the growth and performance of MSMEs operating within industrial infrastructures in Assam, with a particular focus on the Kamrup and Kamrup Metro districts. The study seeks to:

- Analyse key factors—investment, employment generation, profitability, and sales trends—and how they reflect the performance, growth patterns, and challenges of MSMEs.
- Explore barriers to growth
- Assess the contribution of industrial infrastructures to the success and sustainability of MSMEs, while identifying challenges that hinder long-term growth.

2. METHODOLOGY

2.1. Population of the Study

This study considers two primary populations. The first population comprises all industrial infrastructural establishments in the Kamrup and Kamrup (Metro) districts of Assam. The second population includes 227 MSMEs (Micro, Small, and Medium Enterprises) that operate within these establishments. Although there are a total of 239 functioning MSMEs within these districts, data was successfully collected from 227 enterprises.

2.2. Data Collection and Census Survey

Data for this study, spanning the period 2017–2022, was collected through a comprehensive census survey and supported by both primary and secondary sources. The census survey ensured full coverage and representation of all 227 MSMEs operating within the industrial infrastructures of Kamrup and Kamrup Metro districts (Tables 1 and 2). These MSMEs were identified and catalogued across 11 industrial infrastructures, including Industrial

Areas, Industrial Estates, Growth Centres, Food Parks, and Mini Industrial Estates, which are integral to the region's industrial ecosystem.

Primary data, covering trends in employment, investment, profitability, and sales, was collected through field interviews and structured questionnaires administered to MSME units. Additionally, in-depth interviews were conducted with officials from the Assam Industrial Infrastructural Development Corporation (AIIDC), Assam Small Industrial Development Corporation (ASIDC), and Assam Industrial Development Corporation (AIDC). These interactions provided qualitative insights into the operational challenges and opportunities within these settings, enriching the study's findings and aligning with its research objectives.

Secondary data for the same 2017–2022 period was sourced from government reports, research papers, and relevant articles. This additional information validated and complemented the primary data, ensuring a robust and comprehensive understanding of MSME dynamics in the region.

The following table provides a detailed breakdown of the distribution of micro, small, and medium enterprises across the 11 distinct industrial infrastructural establishments in the Kamrup and Kamrup Metro districts.

This table shows that out of the 227 MSMEs, 141 are classified as Micro enterprises, 68 as small enterprises, and 18 as medium enterprises. The distribution of these enterprises across the 11 industrial infrastructures in the Kamrup and Kamrup Metro districts indicates varying levels of industrial activity and infrastructure utilization.

This distribution highlights the concentration of MSMEs in particular industrial areas, with a significant number of microenterprises operating in Industrial Estate, Bamunimaidam, and Industrial Area, Bonda. The presence of medium enterprises is most notable in the EPIP, Amingaon, and Industrial Growth Centers at Jambari and Chatabari, reflecting the role of these centers in accommodating larger enterprises.

The table categorizes the Micro, Small, and Medium Enterprises (MSMEs) based on the type of activity they engage in, providing

Table 1: Distribution Pattern of MSMEs Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022)

Industrial Infrastructure	Micro	Small	Medium	Total Units Functioning
Industrial Area, Rani	04	02	-	06
Industrial Estate, Bamunimaidam	34	12	-	46
Industrial Area, Kalapahar	14	02	-	16
Food Park, Chaygaon	03	02	-	05
EPIP, Amingaon	06	07	03	16
Industrial Growth Centre, Jambari	07	08	05	20
Industrial Growth Centre, Chatabari	10	10	08	28
Industrial Area, Chaygaon	07	08	-	15
Integrated Infrastructure Development Centre, Rangia	05	08	01	14
Mini Industrial Estate, Kalapahar	23	05	-	28
Industrial Area, Bonda	28	04	01	33
Total	141	68	18	227

Source: Field Survey

Table 2: Distribution Pattern of MSMEs by Type of Activity Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022)

Type of activity	Micro	Small	Medium	Total
Food product	21	6	3	30
Plastic product/packaging	25	30	7	62
Printing and Publishing/binding	28	1	1	30
Fabrication	17	1	-	18
Bamboo products	3	-	-	3
Panel and transformer/electrical	7	10	1	18
items/Machine Part				
Agricultural products	-	1	1	2
Steel/wooden furniture/steel utensil	11	1	-	12
Brass and copper casting	1	-	-	1
Glass work	2	1	1	4
Mosquito repellent/stand	-	4	1	5
Clothes and Footwear	1	3	2	6
Bitumen emulsion	-	-	1	1
Paper products/corrugated box	10	2	-	12
Car perfume diffuser	1	1	-	2
Paint booth	1	-	-	1
Aluminum work	3	1	-	4
Plate grinding of offset press	2	-	-	2
Packaged drinking water	2	2	-	4
Solar lamp	1	-	-	1
Nail and Hings	1	1	-	2
Candle factory	1	-	-	1
phenyl	1	-	-	1
Terpolin works	1	-	-	1
HDPE	1	1	-	2
Hatchery	-	1	-	1
Wall putty	-	1	-	1
Total	141	68	18	227

Source: Field Survey

a detailed breakdown of their distribution across different sectors.

Trend analysis is a vital tool in understanding the dynamics of Micro, Small, and Medium Enterprises (MSMEs) over time. This analysis focuses on examining the patterns and changes in key areas such as employment, investment, profit, and sales within MSMEs from 2017 to 2022. By analyzing these trends, we aim to gain insights into the operational and financial health of MSMEs, uncovering underlying patterns and shifts that can inform strategic decisions and policy-making.

Employment Trends: Evaluating employment data helps in understanding the workforce composition of MSMEs, including changes in the number and distribution of managerial, skilled, unskilled, and other workers by gender. This analysis reveals how MSMEs are adapting to labour market conditions and gender dynamics.

Investment Trends: Investment data provides insights into how MSMEs allocate resources towards plant and machinery, land and buildings, and working capital. By examining these investments, we can assess the focus of MSMEs on growth and infrastructure development, and understand the broader economic implications of their investment strategies.

Profit Trends: Analyzing gross and net profit trends highlights the financial performance of MSMEs. This includes understanding

profitability patterns, assessing financial stability, and identifying any correlations between investment activities and profit generation.

Sales Trends: Sales data, particularly domestic sales, reflects the market performance of MSMEs. Although international sales data is absent, the trend in domestic sales offers a view into the market demand and revenue generation capabilities of MSMEs.

This trend analysis provides a comprehensive view of MSME performance over the specified period, offering valuable insights into operational efficiency, financial health, and strategic focus. The findings from this analysis are crucial for stakeholders aiming to understand the evolving landscape of MSMEs and to make informed decisions based on empirical data.

3. RESULTS AND DISCUSSIONS

Employment - The industrial infrastructure establishment's micro, small, and medium-sized enterprises (MSMEs) are a major factor in promoting economic development and expansion. MSMEs play a significant role in the development of jobs in industrial settings. A sizable segment of the populace, including managers and supervisors, skilled, unskilled, and temporary seasonal labors, can find work through them. Because industrial firms are widely dispersed throughout various geographic locations, MSMEs contribute to a more equitable distribution of economic possibilities across various geographic areas, hence reducing reliance on urban centers.

All tables and figures in this section represent data collected from 227 MSMEs operating within industrial infrastructures in Kamrup and Kamrup Metro districts during the period 2017–2022.

The total male and female workers are 6593 and 2450 in 2017–2018. The numbers decreased to 6556 and 2424 in the next year. The number of male workers increased to 6584 and female workers decreased to 2411. The number of male workers decreased to 6254 and 6067 in the year 2020–2021 and 2021–2022. The number of female workers decreased to 2378 and 2318 in the year 2020–2021 and 2021–2022 (Table 3).

The trend lines represent the changes in employment within different categories of workers in the Micro, Small, and Medium Enterprises (MSME) sector from 2017 to 2022.

- Total Male Workers: The trend line for total male workers (y = −135.4x + 6817) shows a consistent decline with a slope of −135.4, indicating a decrease of approximately 135 workers per year.
- Total Female Workers: The trend line for total female workers also shows a decline, but at a much slower rate compared to male workers, with a slope of -31. (y = -31x + 2489.2)
- Category wise
- Managerial and Supervisory Roles:
 - Both male and female workers in managerial and supervisory roles have seen a decline in employment, with male workers decreasing at a faster rate (slope of -7.5, y = -7.5x + 667.7) compared to female workers (slope of -1.3, y = -1.3x + 297.7)

Skilled Workers:

• Skilled male workers have seen a more significant decline (slope of -82.1, y = -82.1x + 4148.9) compared to skilled female workers (slope of -14, y = -14x + 1368.2)

Unskilled Workers:

Both male and female unskilled workers show a decline, with male workers decreasing more rapidly (slope of -28.1, y = -28.1x + 1076.9) compared to female workers (slope of -5, y = -5x + 447.6)

Others:

Employment in the "Others" category has declined for both male (slope of -17.7, y = -17.7x + 923.5) and female workers (slope of -10.7, y = -10.7x + 375.7)

The overall trend from 2017 to 2022 shows a decline in employment across all categories within the MSME sector, with more pronounced reductions in male employment and unskilled labour. The combination of economic challenges, particularly the COVID-19 pandemic, structural shifts in the economy, are likely contributing factors to these trends. The pandemic significantly affected the MSME sector, leading to reduced demand, supply chain disruptions, and business closures. The sharp declines observed in 2020–2021 likely reflect the impact of the pandemic on employment (Figure 1).

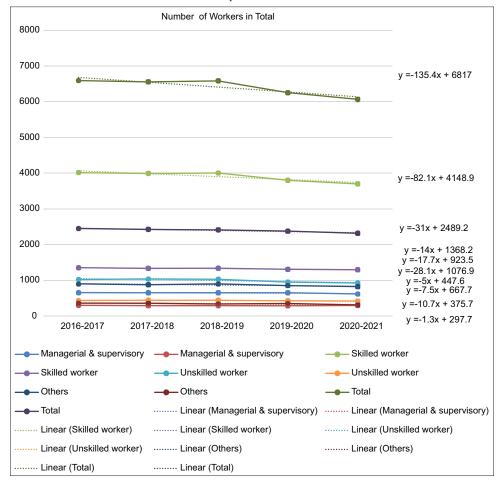
The table compares employment data across different scales for the year 2021–2022, focusing on Micro, Small, and Medium Enterprises (MSMEs) within an industrial area, the entire state of

Table 3: Employment Trends in MSMEs Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022)

Year	Managerial and supervisory		Skilled	worker	Unskille	d worker	O	thers	Т	otal
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
2017-2018	655	301	4016	1354	1022	434	900	361	6593	2450
2018-2019	651	292	3990	1333	1038	442	877	357	6556	2424
2019-2020	651	291	4006	1340	1028	442	899	338	6584	2411
2020-2021	652	289	3801	1307	949	430	852	352	6254	2378
2021–2022	617	296	3700	1297	926	415	824	310	6067	2318

Source : Field Survey

Figure 1: Employment Trends in MSMEs Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022): A Graphical Representation



Source: Derived from Table 3 (Field Survey Conducted by the Authors, 2017–2022)

Assam, and across India. The industrial area in Kamrup districts employs 8,385 workers within its MSMEs. This accounts for 1.493% of all MSME employment in Assam, indicating that while the industrial area is a significant hub for MSMEs within the state, the majority of MSME employment in Assam is spread outside this industrial zone. On a national scale, the workers employed in MSMEs within this industrial area represent 0.0237% of the total MSME employment in India (Table 4). This suggests that the contribution of this specific industrial area to the overall MSME employment landscape in India is relatively minor. The industrial area in Kamrup plays a critical role in the local economy by providing jobs to a significant number of people. The 1.493% employment contribution to Assam's total MSME workforce highlights the industrial area's role as a local employment generator, fostering economic stability and growth in the region. The presence of a concentrated workforce in this area could lead to the development of related infrastructure, services, and supply chains, further stimulating economic activities within Kamrup.

The declining employment trend observed across different categories of workers within the MSME sector from 2017 to 2022 raises important questions regarding the sustainability of job creation in industrial infrastructures. The sharp decline in employment, particularly among skilled and unskilled male workers, suggests that economic challenges and structural shifts in the economy have impacted workforce retention and hiring strategies. Notably, managerial and supervisory roles also show a decline, which may reflect a scaling down of operations or reduced growth prospects within these enterprises.

3.1. Impact of the Pandemic on Employment Patterns

The COVID-19 pandemic played a critical role in disrupting the employment structure of MSMEs. Temporary shutdowns, supply chain disruptions, and reduced demand resulted in job losses, especially among unskilled and temporary workers. The data indicates that unskilled male workers experienced the steepest decline, underscoring the vulnerability of this segment to economic shocks. Although the pandemic was a significant contributor to these trends, the data also highlights pre-existing weaknesses in the employment structure, such as limited job stability and dependency on male workers. Gender Dynamics and Employment Distribution

The gender disparity in employment is evident from the data, with male employment consistently outnumbering female employment across all categories. Even though the rate of decline for female workers is slower, the overall representation of women in managerial, skilled, and unskilled roles remains low. This trend highlights the need for targeted efforts to promote gender inclusion within MSMEs, especially in managerial and supervisory positions. Encouraging women entrepreneurs and

skill development programs for female workers could help bridge this gap.

3.2. Comparison with Employment Trends in Assam and India

A comparison of employment data from the Kamrup districts with Assam and national-level MSME employment reveals that while the industrial area plays an essential role in local job creation, its contribution to the state and national employment landscape remains relatively modest. With only 1.493% of Assam's MSME workforce and 0.0237% of India's total MSME employment concentrated within these industrial areas, it is clear that most employment opportunities in Assam lie outside these industrial infrastructures (Table 4). This raises questions about the effectiveness of these infrastructures in promoting large-scale employment and points to the need for policy interventions that can enhance job creation in these areas.

Opportunities for Improvement and Recommendations

- Incentivizing Job Creation: Policymakers could introduce incentive schemes for MSMEs within industrial areas to expand their workforce, especially by hiring more skilled and female workers.
- Skill Development Programs: To address the decline in skilled labour, industry-specific skill development initiatives in collaboration with educational institutions could be implemented, focusing on emerging sectors like technology and manufacturing.
- Promoting Gender Inclusion: Introducing gender-focused policies and financial incentives for MSMEs that prioritize hiring and promoting women in leadership roles can help improve gender balance within the workforce.
- Infrastructure Upgrades: Improving the quality of infrastructure within industrial estates, such as transport facilities and access to utilities, could attract more enterprises to these areas, boosting employment potential.
- Resilience Strategies for Future Crises: MSMEs should adopt resilience strategies, such as diversifying operations and maintaining flexible workforce models, to mitigate the impact of future disruptions.

By addressing these challenges and implementing strategic interventions, MSMEs within industrial areas can not only recover lost employment but also become significant contributors to job creation and economic stability in the region.

3.3. Investment

 Investment in Plant and Machinery: For MSMEs, plant and machinery investments are essential to increasing productivity, raising capacity, maintaining competitiveness, and guaranteeing long-term sustainability in the dynamic

Table 4: Comparison of MSME Employment in Industrial Areas, Assam, and Across India (2021–2022)

Total Employment in	Total Employment in MSMEs	Total Employment	Industrial Area	Industrial Area
MSMEs in Industrial	(Assam)-includes both outside	in MSMEs (India)	Employment as % of Assam	Employment as % of
Areas/estates of Assam	and inside industrial area		MSME Employment	India MSME Employment
8,385	561,497	35,365,249	1.493%	0.0237%

Source: Ministry of Micro,-Small & Medium Enterprises report 2024

business environment. Micro, Small, and Medium-Sized Enterprises (MSMEs) depend on their ability to develop and succeed in their investments in plant and machinery. MSMEs can increase the amount of output they can produce by investing in equipment and machinery. This is especially crucial as the market for goods and services expands, giving the chance to satisfy consumer demand and look into Investment in Land and Building- Investing in real estate and buildings for MSMEs has several advantages, such as asset appreciation, operational stability, financial leverage, and long-term credibility, all of which support the expansion and sustainability of the company as a whole. It offers a material, long-lasting asset that can be utilized in succession planning or handed down through the generations new company ventures.

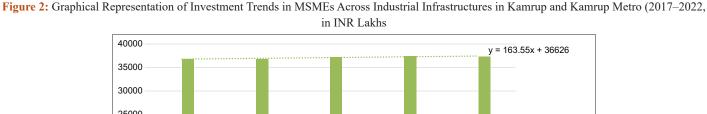
Working Capital: MSMEs need working capital to maintain daily operations, efficiently manage cash flow, adjust to changing conditions, and seize expansion possibilities. MSMEs must have a strong working capital position in order to achieve financial stability and for overall successful. Sufficient working capital acts as a safety net in the event of unanticipated crises, industrial setbacks, or economic downturns. It gives MSMEs the financial fortitude to withstand adversity, manage ambiguity, and carry on with business as usual. MSMEs may have a competitive edge if they have a well-managed working capital position. They have an advantage over rivals because they are better positioned to fulfill orders rapidly, benefit from bulk purchasing savings, and act fast on market opportunities. Working capital is essential to the daily operations of the business along with and overall financial health of Micro, Small, and Medium Enterprises (MSMEs).

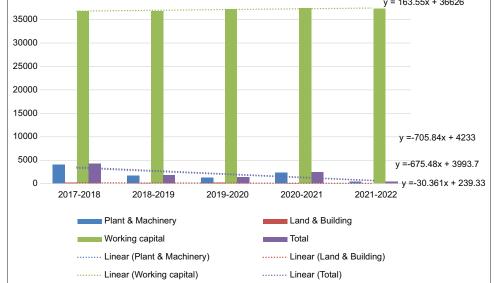
The chart shows the investment trends in Micro, Small, and Medium Enterprises (MSMEs) across different categories, such

as Plant and Machinery, Land and Building, and Working Capital (WC), from 2017-2018 to 2021-2022. The trend lines for each category help to understand how investments have changed over time.

- Plant and Machinery: The trend line for Plant and Machinery shows a significant downward slope (y = -675.48x + 3993.7), indicating a consistent decline in investment over the years. This suggests that MSMEs have been reducing their spending on machinery due to financial constraints.
- Land and Building: The trend for Land and Building also shows a decline (y = -30.361x + 239.33), similar to Plant and Machinery. The slope is steep, indicating a reduction in investment in this area. The entrepreneurs enjoy operational flexibility under industrial area/industrial estate. Leasing or renting land and building offer more flexibility and requires less investment.
- Working Capital (WC): The trend for Working Capital is slightly positive (y = 163.55x + 36626), indicating a gradual increase in investment. This suggests that while capital investments are declining, MSMEs are focusing more on maintaining or increasing liquidity and operational funding.
- Total (Excluding WC): The total investment, excluding working capital, shows a major decline (y = -705.84x + 4233). It suggests that while there is a reduction in investments, it is crucial for policymakers to address the issue impacting investment trend and to create strategies to encourage growth in some key areas.

The trend lines indicate that MSMEs have been decreasing their investments in Plant and Machinery and Land and Building, which due to financial pressures and operational flexibility. In contrast, investment in Working Capital is on an upward trend, emphasizing the importance of liquidity and operational funds over fixed assets. The overall decline in total investments (excluding WC) suggests a cautious approach to capital expenditure in recent years (Figure 2).





Source: Based on Data from Table 5 (Field Survey Conducted by the Authors, 2017–2022)

In the year 2017–2018 the investment in plant and machinery is 2925.79 lakh which decreased to 865.79 lakh and 509 lakhs in the next two years. Again, it increased to 1392.96 lakh in 2020–2021 and decreased to 350 lakhs in 2021–2022. The investment in land and building is 57.50 lakh which reduced to 9 lakh and increased to 18.25 lakh in 2019–2020. The investment decreased to 11.50 lakh in the next year and increased to 24 lakhs in 2021–2022. The investment in working capital is 19845.00 in 2017–2018 which increased to 19895.00 lakh, 20095.00 lakh and 20100.00 till 2020–2021 and it decreased to 20000.00 lakh in 2021–2022 (Table 5).

The investment trends from 2017–2018 to 2021–2022 across categories such as Plant and Machinery, Land and Building, and Working Capital (WC) reflect significant shifts in MSME priorities and operational strategies. These shifts highlight financial constraints faced by MSMEs, particularly in capital expenditures, and emphasize the increasing focus on liquidity over fixed investments.

3.4. Decline in Investment in Plant and Machinery

The trend line for Plant and Machinery shows a significant downward slope (y = -675.48x + 3993.7), indicating a consistent reduction in investments. This reduction suggests that financial pressures and market uncertainties have led MSMEs to limit spending on capital equipment. The lower investments may also reflect limited credit availability and uncertainty during the pandemic, where businesses prioritized operational continuity over expansion.

Such a decline could reduce the productive capacity of MSMEs in the long term, impacting their ability to remain competitive and meet rising consumer demand. Without investment in new machinery and technology, businesses may struggle to improve efficiency and innovation. Addressing this trend will require targeted government incentives for machinery upgrades and subsidized credit schemes for capital investments.

3.5. Land and Building: Preference for Flexibility

The decline in Land and Building investments (y = -2030.361x + 239.33) reflects a shift toward leasing or renting rather than owning physical infrastructure. This trend may indicate that entrepreneurs value operational flexibility in an uncertain economic environment, where commitments to fixed assets are seen as burdensome. The ability to adapt quickly to changing market conditions appears to have driven this behavior, especially during and after the pandemic.

While leasing offers flexibility, limited investments in land and buildings could constrain business growth if enterprises lack adequate facilities to expand operations. Policymakers could introduce tax benefits or grants to encourage strategic real estate investments, especially for businesses looking to expand into industrial estates or specialized growth centres.

3.6. Increase in Working Capital Investments: Emphasis on Liquidity

The trend in Working Capital (WC) shows a slight positive slope (y = 163.55x + 36626), indicating a gradual increase in liquidity management. This suggests that MSMEs are prioritizing operational funding over long-term capital investments, possibly due to economic volatility. A well-managed working capital position allows enterprises to manage cash flow effectively, seize market opportunities, and withstand financial shocks.

The increased focus on working capital highlights the importance of liquidity for MSMEs, enabling them to fulfill orders quickly and maintain operations without disruptions. However, relying heavily on working capital without corresponding investments in plant and machinery may limit long-term growth potential. Policymakers could develop incentive schemes for businesses that balance capital expenditures with adequate working capital management.

3.7. Overall Decline in Total Investment (Excluding WC)

The trend line for total investment (excluding WC) (y = -705.84x + 4233) reflects a major decline in capital expenditures over the period. This cautious approach to investment indicates that MSMEs are adopting conservative strategies, focusing on survival and liquidity rather than growth. While this strategy may offer short-term stability, it could hinder innovation, competitiveness, and scalability in the long run.

3.8. Recommendations for Investment Growth and Sustainability

- Incentivize Capital Expenditures: Introduce tax incentives or subsidies for MSMEs investing in new machinery and technology, encouraging long-term productivity improvements.
- Flexible Financing Options: Provide low-interest loans or leasing options for MSMEs to invest in land and infrastructure, balancing operational flexibility with growth needs.
- Improve Access to Credit: Strengthen financial support programs focused on working capital financing, ensuring that MSMEs can maintain healthy cash flows without sacrificing capital investments.
- Encourage Industrial Infrastructure Investments: Offer grants or infrastructure-specific loans for MSMEs in industrial estates

Table 5: Investment Trends in MSMEs Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022, in INR Lakhs)

Year	Plant and Machinery	Land and Building	Working capital (WC)	Total (Excluding WC)
2017-2018	4115.22	220.11	36773.75	4335.33
2018-2019	1708.22	120.50	36836.50	1828.72
2019-2020	1251.58	207.50	37234.00	1459.08
2020-2021	2338.86	129.11	37455.50	2467.97
2021–2022	422.50	64.00	37282.00	486.50

Source: Field survey, Values are presented in Indian Rupees (INR). For reference, INR 1 Lakh = 100,000 INR.

- to promote expansion and long-term growth.
- Promote Innovation and Technology Adoption: Develop government initiatives that incentivize MSMEs to adopt advanced technologies, ensuring they remain competitive in the evolving market.

3.9. Profit

3.9.1. Gross profit

The industrial region's Micro, Small, and Medium-Sized Businesses' gross profit margins can differ significantly based on a number of variables, including the nature of the business, the state of the market, operational effectiveness, and managerial techniques. To ascertain gross profit margin, a thorough examination of the particular Micro, Small, and Medium Enterprises and their enterprises is necessary. Gross profit is a measure of how well a business produces and markets its goods and services. Sustaining a steady gross profit is crucial to the MSMEs' long-term survival. In order to maintain profitability, sustainability, and market competitiveness, MSMEs in industrial sectors must properly monitor and manage gross profit.

3.9.2. Net profit

A thriving business with a strong net profit can attract and retain talented employees, fostering a motivated and productive workforce. Monitoring and managing net profit effectively is essential for MSMEs in industrial areas to achieve financial success, attract investors, maintain stability, and support long-term growth objectives. Net profit indicates the actual profitability of the Micro, Small, and Medium enterprises after accounting for all expenses, including operating costs, taxes, interest, and depreciation. It reflects the amount of money retained after covering all expenses. Net profit strengthens the business's resilience to challenges raised by economic downturns.

In 2017–2018 gross profit is 39878.47 lakh and it increased to 41056.30 lakh and 41331.35 in 2018-2019 and 2019-2020 again in 2020-2021 it decreased to 40738.10 lakh and in 2021-2022 the amount slightly increased to 40749.15 lakh. The net profit in 2017-2018 is 20521.91 lakh and increased to 21429.59 lakh, 21459.62 lakh in 2018-2019 and 2019-2020. The amount decreased to 20651.76 in 2020-2021 and it slightly increased to 20797.38 lakh in 2021-2022 (Table 6).

The graph shows the gross profit and net profit over five financial years (2017–2022). It includes trend lines with their respective equations, representing the linear trends for both gross profit and net profit.

Gross Profit (Blue Bars and Blue Dotted Line):

- Trend Line Equation: y = 142.32x+40324
 - The trend line has a positive slope (142.32), which indicates that the gross profit is increasing over time.

• The gross profit appears to be relatively stable, hovering around the same range, with a upward trend.

Net Profit (Red Bars and Red Dotted Line):

- Trend Line Equation: y = -22.689x + 21040
 - The trend line for net profit has a negative slope (-22.689), indicating a decline in net profit over time.
 - The net profit remains relatively stable but shows a downward trend, which suggests that expenses, taxes, or other costs might be increasing or revenue might be decreasing over time.

The increase in the gross profit trend is due to Increased sales or revenue generation and Improved efficiency in operations. The decreasing trend in net profit is due to Rising operational costs, interest expenses. market conditions, or increased competition affecting overall profitability.

In summary, while gross profit shows a increasing trend, net profit shows a moderate decline, which suggests that MSMEs are facing increased costs or other financial challenges that are affecting its overall profitability.

3.10. Further Analysis of Profit Trends in MSMEs

The analysis of gross and net profit trends from 2017-2018 to 2021-2022 highlights the financial performance and challenges faced by MSMEs within industrial infrastructures. While gross profit shows a relatively stable and slightly increasing trend, net profit has experienced a moderate decline, reflecting the impact of rising costs and economic challenges (Figure 3).

3.10.1. Gross profit trends: Stable but incrementally increasing

The trend line for gross profit indicates a positive slope (y = 142.32x + 40324), suggesting a gradual increase in profitability over time. This increase can be attributed to:

- Higher revenue generation through increased sales, possibly driven by improved market access and greater operational efficiency.
- Cost-efficient operations, indicating that MSMEs are managing production costs effectively.

However, the relatively small increase in gross profit indicates that MSMEs may be operating under narrow profit margins. This highlights the importance of maintaining competitive operations and seeking opportunities to diversify revenue streams to sustain long-term profitability.

3.10.2. Net profit trends: Declining due to rising expenses

The net profit trend exhibits a negative slope (y = -22.689x + 21040), indicating a decline over the 5-year period. While MSMEs have managed to maintain gross profit, the decline in net profit suggests that operating expenses, taxes, interest, and other costs

Table 6: Profit Trends in MSMEs Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022, in INR Lakhs)

Year	2017–2018	2018–2019	2019–2020	2020-2021	2021–2022
Gross profit (INR Lakhs)	39878.47	41056.30	41331.35	40738.10	40749.15
Net profit (INR Lakhs)	20521.91	21429.59	21459.62	20651.76	20797.38

Source: Field survey, Values are presented in Indian Rupees (INR). For reference, INR 1 Lakh = 100,000 INR.

45000 y = 142.32x + 4032440000 35000 30000 25000 y = -22.689x + 2104020000 15000 10000 5000 0 2017-2018 2018-2019 2020-2021 2021-2022 2019-2020 Linear (Gross profit) Linear (Net profit) Gross profit Net profit

Figure 3: Graphical Representation of Profit Trends in MSMEs Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022, in INR Lakhs)

Source: Based on Data from Table 6 (Field Survey Conducted by the Authors, 2017–2022)

are rising faster than revenue growth. Possible contributing factors include:

- Increased operational costs, such as raw material prices or utility expenses.
- Rising interest expenses due to higher borrowing to manage working capital needs.
- Competitive market conditions, leading to price pressures and reduced profit margins.

The slight improvement in net profit in 2021–2022 may indicate initial recovery from the pandemic, as businesses adapted to new conditions. However, the overall downward trend remains a concern for financial sustainability.

3.11. Implications of Profit Trends for MSMEs

The divergence between gross and net profit trends indicates that MSMEs are struggling to convert operational efficiency into financial sustainability. Rising costs and external challenges, such as market competition and inflation, are eroding profitability, making it harder for these businesses to retain earnings and invest in future growth. This trend underscores the need for cost management strategies and financial planning to improve net profit margins.

3.12. Recommendations to Improve Profitability

- Cost Optimization Strategies: MSMEs should focus on reducing operational costs by adopting energy-efficient technologies and bulk purchasing strategies to lower input costs.
- Access to Subsidized Loans: Providing low-interest loans can reduce interest expenses, easing the pressure on net profit margins.
- Streamlining Operations: MSMEs can improve profitability by automating processes and reducing waste, leading to lower operating costs.
- Improved Financial Planning: Enterprises should adopt better financial forecasting models to manage expenses effectively, ensuring stability in net profits.
- Revenue Diversification: MSMEs can explore new product lines or services and enter new markets, both domestic and international, to increase revenues and improve gross profit margins.

The increasing trend in gross profit reflects that MSMEs are making strides in revenue generation and operational efficiency. However, the decline in net profit emphasizes the importance of cost control and financial management. Without addressing rising expenses, these businesses may face challenges in sustaining long-term profitability and growth. Policymakers and industry bodies need to provide targeted support through subsidies, infrastructure improvements, and credit facilities to ensure that MSMEs can maintain profitability and continue contributing to the regional and national economy.

Sales/Turnover- Sales are crucial for MSMEs operating under industrial infrastructural establishments. positive sales performance improves MSMEs creditworthiness, making it easier for them to obtain financial assistance from banks for expansion. successful MSMEs can contribute to the overall development of industrial area by supporting local economies, infrastructure and social programs. sales are essential for the growth, sustainability and overall success of MSMEs operating under industrial infrastructural establishments playing a pivotal role in their economic and social impact.

There are no international sales in the said years. The domestic sales in 2017–2018 is 149438.00 lakh which increased to 154389.50 lakh, 155346.00 lakh and 155861.00 lakh in subsequent years. There is decreased in sales to 155760.00 lakh in 2021–2022 (Table 7).

The chart displays sales data, separating Domestic and International sales from 2017–2018 to 2021–2022. It includes a linear trend line for Domestic sales.

- 1. Domestic Sales (Blue Dotted Line, with slope = +1411.6):
 - Trend: The trend line for Domestic sales shows a upward trajectory, with a positive slope of +1411.6. This positive slope suggests a gradual increase in Domestic sales over the period. Although the increase indicates steady growth in the domestic market. This growth could be due to several factors such as market expansion and product improvement and favourable economic conditions leading to higher consumer spending within the domestic market.
- 2. International Sales: There is no trend line for international sales, implying that the focus is primarily on Domestic sales.

The Domestic sales are showing a steady increase over the years, which reflects positive growth in the local market. The factors contributing to this growth might include market expansion, product enhancements. The absence of a trend line or data for international sales suggests that the focus is predominantly on Domestic sales, due to the business's strategy and the relatively lower importance of international markets during this period.

3.12. Sales Trends in MSMEs

The sales performance of MSMEs within industrial infrastructural establishments plays a pivotal role in determining their growth, sustainability, and long-term success. Sales turnover not only contributes to the profitability of these enterprises but also improves creditworthiness, making it easier for businesses to obtain financial assistance from banks and other institutions. Steady sales growth can further support the development of local economies, infrastructure, and community programs, reinforcing the economic impact of MSMEs within industrial areas.

Domestic Sales: Positive but Gradual Growth

The trend line for domestic sales (slope = +1411.6) indicates a gradual increase in sales turnover from 2017–2018 to 2020–2021, reflecting steady growth in the local market (Figure 4). This growth could be attributed to several factors:

- Market expansion due to the increasing reach of MSMEs in new regions.
- Product improvements and innovations that resonate with domestic customers.
- Favorable economic conditions that likely boosted consumer spending during the period.

However, the slight decline in 2021–2022 sales (from 155861 lakh to 155760 lakh) suggests that the post-pandemic recovery may not

have been sustained fully (Table 7). This could indicate challenges such as market saturation, increased competition, or changing consumer behavior. Although the overall trend is positive, the slow growth rate suggests that MSMEs might need to explore additional avenues to accelerate sales growth.

3.13. Absence of International Sales: A Missed Opportunity

The lack of international sales throughout the 5-year period suggests that the MSMEs under study have not ventured into export markets. While the primary focus appears to be on domestic markets, diversifying into international markets could open new revenue streams and provide a buffer against local economic fluctuations. The absence of exports may reflect:

- Limited resources or knowledge required for international expansion.
- High barriers to entry such as regulatory challenges, logistics costs, or lack of export networks.
- A strategic focus on domestic sales due to greater familiarity with the local market.

Given that international sales contribute significantly to business scalability and market diversification, developing strategies to enter global markets could enhance the competitiveness and resilience of MSMEs.

3.14. Recommendations for Enhancing Sales Performance

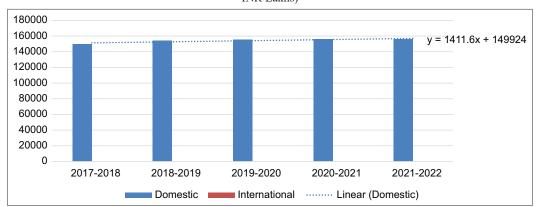
- Focus on Product Differentiation: To accelerate domestic sales growth, MSMEs should invest in innovative product designs and value-added services that differentiate them from competitors.
- 2. Explore Export Markets: MSMEs can collaborate with export promotion agencies and leverage government schemes such

Table 7: Trends in Domestic and International Sales of MSMEs Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022, in INR Lakhs)

Category	2017–2018	2018–2019	2019–2020	2020-2021	2021–2022
Domestic	149438.00	154389.50	155346.00	155861.00	155760.00
International	0	0	0	0	0

Source: Field survey, Values are presented in Indian Rupees (INR). For reference, INR 1 Lakh = 100,000 INR.

Figure 4: Graphical Representation of Sales Trends in MSMEs Across Industrial Infrastructures in Kamrup and Kamrup Metro (2017–2022, in INR Lakhs)



Source: Based on Data from Table 7 (Field Survey Conducted by the Authors, 2017–2022)

- as the Export Promotion Capital Goods (EPCG) scheme to overcome entry barriers in international markets.
- Strengthen Digital Presence: Expanding into e-commerce platforms and improving digital marketing efforts could boost sales by reaching a wider audience, especially in postpandemic markets.
- Expand Market Reach: MSMEs should explore new domestic regions and untapped segments to increase sales. Participation in trade fairs and business networking events can also help build new customer bases.
- Develop Export Readiness Programs: Government and industry bodies should organize export-readiness training for MSMEs, focusing on international market trends, compliance requirements, and logistics.

While the steady growth in domestic sales reflects positive momentum for MSMEs, the lack of international sales points to missed opportunities in global markets. To sustain long-term growth and enhance competitiveness, MSMEs must diversify their market presence by exploring export opportunities. This will not only improve their sales performance but also contribute to the overall development of industrial areas by fostering economic stability and promoting regional development.

3.15. Impact of Industrial Infrastructure on the Growth and Sustainability of MSMEs

The researcher conducted a field survey across various industrial areas, estates, and growth centres in Kamrup and Kamrup Metro districts to evaluate how these infrastructures contribute to the success and sustainability of MSMEs. The study assessed the role these infrastructures play in business operations, identified specific advantages and challenges faced by MSMEs, and explored how proximity to Guwahati influences market access and resource availability.

The findings reveal that industrial infrastructures provide key operational support to MSMEs, enabling them to maintain efficiency and continuity. Facilities such as uninterrupted power, piped water supply, and street lighting help reduce operational downtime, ensuring smoother production cycles. The availability of factory sheds, allotted land, and employee amenities—including dormitories and canteens—further aids in business setup and workforce retention. Additionally, connectivity to major transportation networks such as railheads, airports, and public transport facilitates the movement of goods and labour, improving access to markets and reducing logistical challenges.

One of the most significant advantages of these industrial infrastructures is their proximity to Guwahati, the commercial hub of the Northeast. This strategic location enhances MSMEs' ability to source raw materials efficiently and reach wider markets, giving them a competitive advantage. Businesses operating in these areas benefit from better supplier networks and faster access to consumers, contributing to their growth and market presence.

However, the study also identified several challenges within these infrastructures. A key issue is the inadequate maintenance of infrastructure, including the absence of sewage and effluent treatment plants, which forces enterprises to bear additional compliance costs. The lack of renewable energy solutions limits opportunities for MSMEs to adopt sustainable practices. Furthermore, skill development centres, banking services, and functional single-window clearance systems are missing, increasing the administrative burden on businesses and reducing operational efficiency.

The reliance on external decision-making by head offices located outside Assam further complicates operations, leading to delayed responses to market changes and hindering business agility. Additionally, logistical challenges persist due to the lack of dedicated bus stops and nearby logistic terminals, affecting both worker convenience and transport efficiency. MSMEs also face safety concerns, as disaster management facilities and healthcare services are unavailable within many industrial estates, posing risks to workforce well-being and compliance.

4. CONCLUSION AND POLICY IMPLICATIONS

This study offers an in-depth analysis of the growth and performance of MSMEs within the industrial infrastructures of Assam, focusing specifically on Kamrup and Kamrup Metro districts. The findings highlight key trends across investment, employment, profitability, and sales, along with the influence of industrial infrastructure on MSME sustainability. While the study demonstrates the potential of MSMEs to contribute to regional economic development, several challenges also surfaced, particularly in terms of declining investments and employment.

4.1. Key Findings

- Employment trends indicate a gradual decline over the years, with male and unskilled labour categories being most affected.
 This decline reflects structural economic shifts and challenges exacerbated by the pandemic.
- Investments in plant and machinery have shown a downward trend, largely due to financial constraints and market uncertainties, while working capital investments have remained relatively stable.
- Profitability and sales trends reveal stable gross profits but a slight decline in net profits, signalling increasing operational costs and competitive pressures.

These findings emphasize the critical role of industrial infrastructure in facilitating MSME growth, particularly through improved market access, infrastructure, and resource availability. However, challenges like limited access to finance, delays in debtor payments, and reliance on external head offices hinder optimal performance. The proximity to Guwahati provides a strategic advantage, but infrastructure and operational bottlenecks need to be addressed to unlock the full potential of MSMEs in the region.

4.2. Policy Implications

The insights from this study have significant policy implications:

1. Enhanced Financial Support: Addressing the credit gap for MSMEs through targeted financial policies, including

- subsidies and easier access to credit, can boost investment in capital assets.
- 2. Infrastructure Development: Upgrading existing industrial areas and estates to meet modern business needs will enhance MSME productivity and employment generation.
- 3. Skill Development Initiatives: Focused programs to train both skilled and unskilled labour can address employment declines and provide sustainable job opportunities.
- 4. Promoting Market Access: Policies to facilitate interstate trade and encourage MSME participation in export markets will support sales growth and profitability.

4.3. Limitations and Future Research

While this study provides valuable insights into MSME performance within Kamrup and Kamrup Metro districts of Assam, its regional focus inherently limits the generalizability of the findings to other regions. However, this limitation also presents opportunities for further research. Future studies could expand to include additional districts in Assam or similar industrial hubs across India, providing a broader understanding of MSME dynamics.

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