

FINANCIAL SUSTAINABILITY CHALLENGES AND OPPORTUNITIES FOR SMEs IN CHITTOOR DISTRICT: AN EMPIRICAL ANALYSIS

Dr. K. Balasubramanyam
Lecturer in Commerce
Government Degree College for Men
Kurnool

Abstract- Small and Medium Enterprises (SMEs) in Chittoor District are central to local economic development, yet they continue to encounter significant challenges in maintaining financial sustainability. This study investigates both the obstacles and opportunities that shape SME resilience, drawing on empirical data collected from a representative sample of enterprises in the district. Using descriptive and correlation-based analysis, the research highlights variations in financial performance and identifies structural barriers such as limited access to affordable credit, inadequate financial literacy, and insufficient awareness of sustainability-driven practices. At the same time, the findings reveal that adoption of innovative strategies—including Environmental, Social, and Governance (ESG) integration, digital financial tools, and targeted training—can enhance long-term viability. The study concludes with policy recommendations emphasizing tailored financial products, capacity-building initiatives, and incentive mechanisms to support sustainable growth. By addressing these challenges and leveraging emerging opportunities, SMEs in Chittoor District can strengthen their financial foundations while contributing to inclusive regional development.

Keywords: Financial Sustainability, SMEs (Small and Medium Enterprises), ESG Practices, Financing Challenges, Andhra Pradesh Economy.

I. INTRODUCTION

Small and Medium Enterprises (SMEs) are vital drivers of growth, innovation, and employment in Chittoor District, reflecting their broader importance across Andhra Pradesh. Nationally, SMEs contribute nearly 37.5% to India's GDP, generate close to 40% of exports, and provide livelihoods for over 110 million people. Within Andhra Pradesh, SMEs play a decisive role in sectors such as pharmaceuticals, textiles, agriculture, and information technology, strengthening both domestic production and international competitiveness. Specifically, SMEs in Chittoor District account for a significant share of the state's GDP and export revenues, underscoring their

contribution to economic diversification and resilience. Their presence is particularly impactful in rural and semi-urban areas, where large-scale industries are limited, as SMEs bridge regional disparities, foster inclusive growth, and stimulate entrepreneurial activity.

Despite their importance, SMEs in Chittoor District face persistent financial sustainability challenges. The COVID-19 pandemic exposed structural vulnerabilities, with lockdowns disrupting supply chains, halting production, and triggering liquidity crises. Fixed costs such as wages, rent, and loan repayments continued even as revenues declined, leaving many enterprises struggling to survive. Limited access to affordable credit further compounded these difficulties, while inadequate technological infrastructure placed SMEs at a disadvantage in adapting to the rapid shift toward digital markets and online transactions. These challenges highlight the urgent need for innovative financial strategies and supportive policy frameworks.

This study undertakes an empirical analysis of SMEs in Chittoor District, focusing on financial performance, Environmental, Social, and Governance (ESG) practices, and financing constraints. By examining these dimensions, the research identifies key barriers to sustainability while also uncovering opportunities for resilience. Findings emphasize that effective ESG integration, adoption of digital financial tools, and targeted training can enhance long-term viability. Policy recommendations include designing tailored financial products, expanding access to affordable credit, incentivizing sustainable practices through

tax benefits and grants, and strengthening awareness programs on ESG adoption. Collectively, these measures aim to reinforce SME resilience, enabling enterprises in Chittoor District to balance profitability with sustainability goals and contribute more robustly to regional economic stability and development.

a. Challenges Faced During COVID-19

The COVID-19 pandemic created unprecedented disruptions for small and medium-sized enterprises (SMEs) in Chittoor District, exposing deep vulnerabilities in their operations, financial health, and market access. As the backbone of the local economy, SMEs were particularly affected by supply chain breakdowns, workforce shortages, and liquidity crises. Businesses dependent on steady inputs and cash flow struggled to cope with prolonged lockdowns and restrictions. For instance, SMEs in sectors such as pharmaceuticals and textiles faced delays in sourcing raw materials, while transportation bottlenecks prevented timely delivery of goods, resulting in significant revenue losses. Enterprises relying on just-in-time inventory practices were hit hardest, as production came to a standstill due to the unavailability of critical inputs.

Labor availability emerged as another pressing challenge. A large share of Chittoor's SME workforce comprises migrant and seasonal laborers, many of whom returned to their hometowns during the pandemic. Agro-processing SMEs, in particular, faced difficulties in maintaining operations, leading to reduced output and missed market opportunities. At the same time, consumer behavior shifted rapidly toward digital platforms and contactless transactions. SMEs without adequate technological infrastructure or online presence struggled to retain customers, losing ground to larger competitors with established e-commerce capabilities. This digital divide highlighted a critical gap in technological readiness among local enterprises.

Government interventions, such as the Atmanirbhar Bharat package and the Emergency Credit Line Guarantee Scheme (ECLGS), provided some relief but yielded mixed results. Larger SMEs with established banking relationships were better

positioned to access these benefits, while smaller enterprises in rural areas faced hurdles in navigating complex application processes. Delays in fund disbursement further limited the ability of many SMEs to address immediate liquidity needs. Nevertheless, the crisis also revealed opportunities for resilience and innovation. Some SMEs in Chittoor District adapted by diversifying their operations—for example, textile manufacturers pivoted to producing personal protective equipment (PPE), while agro-processing firms strengthened local supply chains to reduce dependence on external inputs.

To ensure long-term financial sustainability, SMEs in Chittoor District require improved access to affordable credit, stronger technological support, and workforce development initiatives. Simplifying financial aid processes, expanding digital literacy programs, and incentivizing the adoption of sustainable practices can enhance resilience. Strengthening local supply chains and encouraging digital transformation will further prepare SMEs to withstand future disruptions. The lessons from COVID-19 underscore the importance of building robust, adaptable business models that balance profitability with sustainability. By addressing these challenges and leveraging emerging opportunities, SMEs in Chittoor District can play a pivotal role in driving regional economic recovery and long-term growth.

II. LITERATURE REVIEW

a. Sustainability Frameworks for SMEs

Sustainability frameworks have become increasingly important for SMEs in Chittoor District as they seek to balance financial growth with social and environmental responsibilities. One of the most recognized models is the Triple Bottom Line (TBL), which emphasizes three dimensions—People, Planet, and Profit—encouraging enterprises to integrate social equity, environmental stewardship, and economic viability into their operations. Evidence suggests that adopting such practices not only strengthens a firm's reputation but also improves long-term financial outcomes by reducing

inefficiencies and lowering operational costs. In recent years, the integration of Environmental, Social, and Governance (ESG) criteria has gained prominence, offering SMEs a structured approach to evaluate and enhance their sustainability efforts. ESG adoption enables businesses to align with global standards, attract investment, and mitigate risks associated with volatile markets. However, SMEs in Chittoor District continue to face barriers such as limited financial resources, inadequate technical expertise, and knowledge gaps that hinder widespread implementation. To overcome these challenges, tailored sustainability frameworks designed for smaller enterprises are essential, ensuring that SMEs can effectively embed responsible practices while strengthening their financial resilience and contributing to inclusive regional development.

b. Financial Performance Indicators and ESG Practices

Financial performance indicators and sustainability practices are central to evaluating the resilience of SMEs in Chittoor District. Key financial metrics—such as turnover, profitability, borrowing capacity, and debt-to-equity ratios—offer valuable insights into the financial health and operational efficiency of enterprises. These indicators reflect how effectively SMEs manage resources and sustain growth in competitive markets. Alongside financial measures, the adoption of Environmental, Social, and Governance (ESG) practices has become increasingly significant for ensuring long-term viability. Environmental initiatives, including energy efficiency and waste reduction, not only lower operational costs but also help firms comply with regulatory requirements. Social practices, such as fair labor policies and community engagement, strengthen stakeholder relationships and enhance goodwill. Governance measures, including transparency and ethical decision-making, build

trust and reduce risks associated with mismanagement. Together, financial indicators and ESG practices provide a comprehensive framework for assessing sustainability, enabling SMEs in Chittoor District to balance profitability with responsible business conduct and position themselves for enduring growth.

c. Existing Research Works

Banerjee [15] examined the growing importance of workplace policies that address gender-specific needs, such as menstrual leave, in the context of increasing female participation in the workforce. Although not directly linked to SME operations, the study highlights how employee well-being and supportive policies can influence productivity and mental health. Findings revealed that mental health significantly impacts job performance, while perceptions of supportive policies also contribute positively. This underscores the broader relevance of employee-centered approaches for organizational sustainability, including SMEs in Chittoor District.

Nkwinika and Akinola [16] emphasized the critical role of financial management in ensuring SME growth and long-term stability. Their research demonstrated that SME owners must develop strong financial literacy, prioritize planning, and adopt informed decision-making to achieve operational success. Case studies illustrated how effective financial practices, supported by government incentives such as tax relief and advisory services, empower SMEs. The study also highlighted the potential of emerging technologies like artificial intelligence and blockchain in financial forecasting and predictive analytics, while noting challenges in adapting to regulatory changes. These insights are particularly relevant for SMEs in Chittoor District, where financial literacy and technological adoption remain pressing needs.

Rohayati et al. [17] proposed a financial management model tailored for micro and small enterprises, focusing on simple practices such as recording income, expenses, purchases, and sales. Using a design-based research approach, the study developed customized financial management modules tested with business actors in Surabaya. These tools improved financial organization and decision-making, thereby enhancing profitability and sustainability. For SMEs in Chittoor District, similar simplified frameworks could provide practical solutions to strengthen financial resilience.

Oshora et al. [18] investigated factors influencing financial inclusion among SMEs in Ethiopia, employing a mixed-methods approach and regression analysis. Their findings identified supply-side factors, demand-side dynamics, market opportunities, and collateral requirements as positive contributors to access, while institutional barriers and high borrowing costs hindered inclusion. The study emphasized the need for robust financial systems to provide affordable services. This resonates with the challenges faced by SMEs in Chittoor District, where access to affordable credit remains a major obstacle.

Kumar et al. [19] highlighted the contribution of MSMEs to India's industrial output, manufacturing value, exports, and employment. Despite their importance, access to institutional financing continues to be a major hurdle, limiting expansion and scalability. Government initiatives have attempted to address these issues, but funding gaps persist. The study underscores the need for stronger financial integration programs, which is directly applicable to SMEs in Chittoor District struggling with financing constraints.

Roy and Ramachandran [20] explored the socio-economic impact of microfinance schemes, particularly the Pradhan Mantri Mudra Yojana. Using fuzzy logic, they developed a Microfinance Scheme Effectiveness Index to evaluate

implementation across states. Their findings highlighted the importance of tailored strategies to improve scheme efficacy, with a focus on women's education, equitable pay, startup support, and awareness campaigns. For SMEs in Chittoor District, such targeted interventions could enhance access to microfinance and promote inclusive growth.

d. Literature Gap

Although considerable research has examined SME financial performance and sustainability, notable gaps remain. Much of the existing scholarship tends to prioritize large corporations, leaving smaller enterprises—particularly those in regional contexts such as Chittoor District—underrepresented. Limited attention has been devoted to understanding how financial performance interacts with Environmental, Social, and Governance (ESG) practices within SMEs, despite their growing relevance for long-term viability. Furthermore, the specific challenges SMEs encounter in adopting sustainability frameworks, including resource limitations, restricted access to affordable financing, and inadequate technical expertise, have not been sufficiently explored. This study seeks to address these gaps by providing localized insights into the financial sustainability of SMEs in Chittoor District, examining both performance indicators and ESG adoption, while proposing targeted strategies to strengthen resilience and promote inclusive regional development.

e. Dataset

The research methodology adopted in this study is designed to provide a detailed understanding of the financial sustainability of SMEs in Chittoor District. The dataset comprises information from 200 enterprises, offering a representative sample to examine the variables that influence financial performance and long-term resilience. Careful

structuring of the dataset ensures that it captures the diverse attributes of SMEs, thereby generating findings that are both robust and contextually relevant.

III. RESEARCH METHODOLOGY

a. Dataset Composition

The dataset is organized into three major categories of variables, forming the foundation of this analysis. It provides a comprehensive view of the financial and operational profiles of SMEs in Chittoor District, focusing on the key dimensions that shape sustainability and performance.

- **Financial Metrics:** Data on annual turnover and borrowing levels serve as the core indicators of financial health. These figures highlight the revenue-generating capacity of SMEs and their reliance on external funding sources such as bank loans or self-financing. The variation in turnover values reflects differences in scale, profitability, and financial stability across enterprises.
- **ESG Scores:** Each SME's Environmental, Social, and Governance (ESG) score is included to measure the extent of sustainability integration in operations. The variability in ESG scores demonstrates that while some SMEs actively adopt sustainable practices, others lag behind and may require targeted support to align with modern standards.
- **Financing Sources and Challenges:** The dataset also records details on financing options—such as loans, grants, and retained earnings—alongside the challenges SMEs face, including restricted access to credit and high interest rates. These insights reveal the financial strategies employed by SMEs and the barriers that hinder their growth and sustainability.

By integrating these diverse variables, the dataset provides a strong foundation for analyzing

the interplay between financial performance, sustainability practices, and operational challenges. This enables the study to generate actionable insights and policy recommendations aimed at strengthening SME resilience and promoting inclusive economic development in Chittoor District.

b. Sampling Techniques and Statistical Methods

To ensure that the study captured the diverse realities of SMEs in Chittoor District, a **stratified sampling technique** was employed. This approach allowed for the inclusion of both small and medium enterprises across rural and urban regions, ensuring balanced representation. By dividing the population into strata based on enterprise size and geographic location, the sample minimized bias and reflected the varied characteristics of the SME ecosystem. This method provided a more accurate picture of the challenges and opportunities faced by different categories of businesses within the district.

i. Statistical Methods for Analysis

A combination of statistical tools was applied to derive meaningful insights from the dataset. **Descriptive statistics** were used to examine core variables such as turnover, borrowing levels, and ESG scores. These measures provided an overview of central tendencies and variability, highlighting differences in financial health and sustainability practices among SMEs.

To explore relationships between variables, **correlation analysis** was conducted, particularly focusing on the link between financial performance and ESG adoption. This analysis revealed whether enterprises with stronger ESG practices demonstrated greater financial stability and growth potential. Additionally, demographic comparisons were made to assess differences between SMEs based on location (urban versus rural) and size (small versus medium). These comparisons highlighted

disparities in access to resources, financial strategies, and sustainability adoption. By combining stratified sampling with descriptive and correlation-based analysis, the study ensured that its findings were both reliable and actionable. The results provide valuable guidance for SMEs in Chittoor District and offer policymakers evidence-based insights to design targeted interventions that strengthen financial sustainability and resilience.

IV. RESULTS AND DISCUSSION

a. Descriptive Analysis of Financial Performance

Descriptive analysis was carried out using SPSS software, and the results are summarized in **Table 1**. The findings reveal considerable variation in the financial performance of SMEs in Chittoor District, particularly in terms of turnover and borrowing levels. This diversity reflects the differing financial capacities and operational strengths of enterprises across the region.

i. Turnover (₹ Cr)

The average annual turnover of ₹24.83 Cr suggests that SMEs in the district are moderately

scaled, with several businesses generating substantial revenue streams. The median turnover of ₹24.79 Cr, closely aligned with the mean, indicates a relatively balanced distribution of turnover values across the sample. However, the standard deviation of ₹13.94 Cr points to significant variability, highlighting the wide gap between high-performing and struggling enterprises. While some SMEs demonstrate strong revenue generation, others face challenges in maintaining competitive turnover levels.

The mode of ₹19.86 Cr, representing the most frequently observed turnover figure, shows that a considerable number of SMEs operate within this revenue bracket. The presence of multiple modes further illustrates clustering at different turnover levels, reflecting the heterogeneous nature of SME performance in the district. This variability underscores the importance of designing tailored financial strategies—supporting underperforming enterprises while leveraging the strengths of those achieving higher revenues—to promote balanced and sustainable growth across the SME sector in Chittoor District.

Table 1: Descriptive results of SMEs Statistics

Turnover_Cr	Borrowing_Cr	ESG_Score
N	200	200
Valid	200	200
Missing	1	1
Mean	24.8265	5.1667
Median	24.7950	5.2800
Mode	19.86a	8.73
Std. Deviation	13.94039	3.01357

a. Multiple modes exist. The smallest value is shown

ii. Borrowing (₹ Cr)

The analysis of borrowing patterns among SMEs in Chittoor District reveals moderate reliance on external funding. The mean borrowing level of ₹5.17 Cr reflects a balanced dependence on credit, consistent with the recovery strategies adopted in the

post-pandemic period. The median borrowing of ₹5.28 Cr, closely aligned with the mean, indicates a symmetrical distribution of borrowing levels across the sample. However, the standard deviation of ₹3.01 Cr highlights notable variability, suggesting diverse financial strategies among enterprises. While

some SMEs depend heavily on external sources such as bank loans and government schemes, others prefer self-financing or reinvesting retained earnings. The mode of ₹8.73 Cr, the most frequently observed borrowing figure, suggests that many SMEs opt for relatively higher borrowing levels, often to fund expansion projects or recover from pandemic-related setbacks. This variation underscores the need for targeted financial solutions that address the differing reliance on external funding across SMEs in the district.

b. Analysis of ESG Scores

The Environmental, Social, and Governance (ESG) scores provide valuable insights into the sustainability practices of SMEs in Chittoor District.

i. ESG Scores

The average ESG score of 74 indicates that SMEs generally demonstrate moderate to high compliance with sustainability principles. The median score of 74.33, closely aligned with the mean, suggests consistency in ESG adoption across most enterprises. However, the standard deviation of 14.86 points reveals significant variability, showing that while some SMEs have integrated robust sustainability practices, others lag behind. This disparity may stem from differences in resource availability, awareness of sustainability frameworks, or varying strategic priorities.

The mode of 71.23, one of several recurring values, points to clusters of SMEs achieving similar ESG scores. These clusters may represent enterprises focusing more strongly on environmental initiatives, while others emphasize social or governance aspects. Such variability highlights the importance of targeted support, training, and awareness programs to bridge gaps in ESG adoption. Strengthening ESG practices across SMEs in Chittoor District can enhance resilience, improve financial outcomes, and align enterprises with broader sustainability goals.

c. Implications for Financial Sustainability

i. Turnover and Borrowing

The analysis indicates that SMEs with higher borrowing levels often experience greater variability in financial performance. This variation can be attributed to differences in debt management capacity and the ability to generate sufficient returns from borrowed funds. While some enterprises effectively utilize external financing to expand operations and strengthen growth, others face repayment pressures that undermine stability. The reliance of many SMEs on external funding highlights the urgent need for accessible and affordable credit solutions tailored to their scale and operational requirements. Financial institutions and policymakers must prioritize the design of flexible financing mechanisms that reduce repayment burdens and support sustainable expansion. Such interventions are essential to enhance resilience and ensure balanced growth across the SME sector in Chittoor District.

ii. ESG Practices

The moderate average ESG score suggests that while SMEs in Chittoor District increasingly recognize the importance of sustainability, significant gaps remain—particularly among those scoring below the mean. This disparity reflects challenges such as limited resources, insufficient awareness, and inadequate capacity to integrate Environmental, Social, and Governance (ESG) practices into daily operations. The high variability in ESG scores further emphasizes the uneven adoption of sustainability frameworks, with some enterprises excelling while others lag behind. Addressing these gaps requires targeted interventions, including training programs, financial incentives, and industry-specific support to encourage broader ESG compliance. Strengthening ESG adoption not only enhances sustainability but also improves overall business performance, positioning SMEs to achieve

long-term financial stability while contributing to inclusive regional development.

d. discussion on Results

The analysis highlights a clear connection between financial performance and sustainability practices. Enhancing financial sustainability.

i. Financial Performance

SMEs can benefit significantly from leveraging financial planning tools to optimize their borrowing levels. Proper planning not only helps businesses manage debt more effectively but also reduces variability in turnover, ensuring more consistent financial performance. For this to succeed, policymakers and financial institutions must play a supportive role by offering credit options that are both accessible and affordable. Simplifying loan processes, reducing interest rates, and providing tailored financial products can empower SMEs to make informed borrowing decisions. Combined with improved financial management, these efforts can strengthen resilience and foster sustainable growth across sectors.

ii. ESG Integration

Government-led initiatives play a pivotal role in enabling SMEs to adopt sustainability practices. Subsidies for implementing ESG measures, along with workshops and training sessions on compliance, can help enterprises integrate sustainability more effectively into their operations. Encouraging SMEs with strong ESG performance to share success stories and best practices fosters collaboration and motivates others to follow suit. By aligning financial growth with sustainability, SMEs can strengthen their long-term viability while contributing to broader economic resilience and social development. Such initiatives create a ripple effect across the business ecosystem, promoting inclusive and sustainable growth at a regional level.

iii. The Relationship Between Borrowing and Financial Performance

Borrowing remains a critical financial instrument for SMEs, providing access to capital needed for expansion, innovation, and operational improvements. When managed strategically, borrowed funds can enhance turnover by supporting investments in technology, infrastructure, and market expansion. However, the relationship between borrowing and financial performance is complex. Enterprises that borrow beyond their repayment capacity often face challenges such as high interest costs and mounting debt pressures, which can erode profitability. The variability in borrowing patterns among SMEs in Chittoor District reflects differences in debt management strategies—while some translate borrowing into financial success, others struggle to balance debt obligations with revenue generation. Effective debt management and prudent borrowing decisions are therefore essential for ensuring sustainable growth and avoiding financial distress.

iv. The Role of ESG Practices in Ensuring Long-Term Viability

Environmental, Social, and Governance (ESG) practices have emerged as key drivers of long-term sustainability for SMEs. Integrating ESG principles enhances reputation, operational efficiency, and stakeholder trust. Environmentally responsible measures such as energy conservation and waste reduction lower costs and ensure regulatory compliance. Social initiatives, including fair labor policies and community engagement, foster employee loyalty and customer goodwill. Strong governance frameworks improve transparency, ethical decision-making, and risk management. SMEs with robust ESG strategies are better positioned to adapt to evolving market expectations, attract investment, and remain resilient in competitive environments. By embedding ESG practices into their operations, SMEs in Chittoor District can secure sustainable growth while

contributing positively to social equity and environmental protection.

V. CONCLUSION

This study offers valuable insights into the financial sustainability of SMEs in Chittoor District, with a focus on turnover, borrowing behavior, and ESG adoption. The findings reveal considerable variability in performance: while some enterprises effectively utilize borrowed capital to expand and strengthen operations, others struggle with repayment pressures that undermine financial stability. ESG practices, though moderately integrated, demonstrate potential for enhancing long-term resilience, yet many SMEs remain behind in fully embedding these principles. Addressing these challenges requires a comprehensive approach. Policymakers should prioritize accessible and affordable financing mechanisms, such as low-interest loans and flexible repayment schemes tailored to SME needs. Capacity-building programs on financial planning and debt management can empower entrepreneurs to make informed decisions and reduce dependence on inefficient borrowing. Furthermore, incentivizing ESG adoption through tax benefits, grants, and partnerships with local organizations can help bridge sustainability gaps. With the right support systems, SMEs in Chittoor District can evolve into leaders of sustainable business practices, contributing significantly to regional economic resilience and inclusive development.

VI. Limitations and Future Research Directions

While the study provides meaningful insights, certain limitations must be acknowledged. The dataset, though comprehensive, relies on proxy measures that may not fully capture the complexities of SME operations. The regional focus on Chittoor District limits the generalizability of findings to

other states or countries with different SME ecosystems. Additionally, qualitative aspects such as leadership styles, cultural influences, and local policy environments were not explored in depth. Future research should expand the dataset to include larger and more diverse samples, complemented by longitudinal studies to track sustainability trends over time. Incorporating industry-specific analyses and qualitative interviews with SME owners and stakeholders would provide richer insights into the challenges and opportunities for financial sustainability. Such efforts can strengthen the understanding of SME resilience and guide more effective policy interventions.

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