



Cost Management and Supply Chain Management: Experiences of Vulnerable SMEs during COVID-19

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Abstract

Small and Medium Enterprises (SMEs) constitute the vital economic fabric of Thailand, catalyzing growth and employment opportunities. However, the advent of disruptive events, exemplified by the COVID-19 pandemic, poses formidable challenges to their sustainable development. Adequate cost management and supply chain management are crucial for these SMEs to sustain themselves through disruptive scenarios. This study aims at exploring, understanding, and analyzing various factors that would impact the reduced vulnerability of SMEs and enhance the sustainability of the Thai economy. The methodology adopted for this research is the qualitative method. The data has been collected through semi-structured interviews and in-depth interviews, and secondary data has been collected through online and printed sources. The data analysis involves content analysis of the themes that are deduced from the extensive literature review. Furthermore, the data has been analyzed with Strength, Weakness, Opportunity, and Threats (SWOT) to analyze the impacts of internal and external factors on the sustainability of the SMEs. The study's findings divulge a spectrum of challenges spanning cost management intricacies, socio-cultural influences, and economic nuances that collectively impede SME progress. The absence of effective governmental policies, regulations, and actual need assessments of society and the economy results in enhanced vulnerabilities for SMEs. Similarly, the risk perceptions of the SMEs were found to be inaccurate, which led to ineffective cost management strategies and supply chain management during the COVID-19 pandemic. These findings cover the existing literature gap. The research paves the way for further micro-level research into the amalgamated impact of cost management and adequate supply chain management, especially during disruptive events such as the COVID-19 pandemic.

Keywords:

Disaster Vulnerability;
Small and Medium Enterprises (SMEs);
Cost Management;
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1- Introduction

Every Small and Medium Enterprise (SME) must prioritize the pursuit of sustainability to ensure long-term success, even in the face of challenges such as disasters. To achieve this, it is imperative to engage in comprehensive planning that integrates cost management and supply chain management processes. Thai SMEs contribute to 45% of the total Gross Domestic Product (GDP) and were severely affected by the COVID-19 pandemic. The enhanced vulnerability was a direct result of the lack of experience-oriented decision-making. The absence of a common platform for all stakeholders enhanced the vulnerabilities of the SMEs. The gap in the existing literature in terms of the amalgamated impact of adequate cost and supply chain management results in vulnerabilities for SMEs [1, 2].

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This research paper aims to examine the experiences of SMEs in Thailand, with a particular focus on the cost management approach employed through the supply chain processes during the catastrophic impacts of the COVID-19 pandemic. The pandemic significantly intensified losses, prompting an exploration of how cost management and supply chain management strategies can minimize the adverse effects of the pandemic and future disasters [3]. Adequate cost management and smooth supply chain management are crucial for resilient SMEs. This research adopts a theoretical approach that focuses on analyzing various theories and models related to strategy, specifically examining the variables of supply chain and cost [4].

The research explores the factors involved in disaster vulnerability reduction among SMEs. Previous literature lacks exploration of the combined effects of social, cultural, economic, and resilience factors while implying strategies for adequate strategic cost management and supply chain management [5]. Therefore, the enhanced exposure of SMEs during the COVID-19 pandemic has been explored in this research.

2- Literature Review

The theoretical framework encompasses the socio-economic and cultural dependency upon the SMEs [6, 7]. Several previous studies have adopted the theoretical framework for enhancing the sustainable development of local communities through strengthening vulnerable SMEs [8, 9]. SMEs contribute to the majority of employment, provide economic stability, and provide a mechanism for rapid growth and development [10–12]. SMEs coping with disasters and implying effective strategic cost management and supply chain management were found to be lacking in the existing literature. Social, economic, and cultural factors have a direct impact on the SMEs in Thailand. Therefore, this research aims to bridge the research gap and enhance resilience among disaster-vulnerable SMEs.

The interplay between multiple factors that influence the success and sustainability of Small and Medium Enterprises (SMEs) is crucial [13]. These key factors encompass controlling costs, ensuring product and service quality, maintaining accurate lead times and deliveries to remain competitive, fostering an innovative mindset for continuous growth and survival in the market, and overall effective management of the business enterprise. Some of the strategic terminologies are discussed below:

Activity-Based Costing (ABC), widely known as a cutting-edge costing practice, focuses on indirect costs related to activities and their usage at the source level [14]. This approach considers cost units such as inventory management and energy consumption, which are then allocated to each unit or process to effectively control or reduce costs associated with specific business activities [15]. Benchmarking is a practice that entails identifying areas for improvement and motivating organizations to emulate the strategies and direction set by industry leaders. A benchmark serves as a target to aspire to, and it involves the implementation of necessary strategies to reach that target.

In recent times, there has been a focus on Quality Cost (QC) and Total Quality Management (TQM) as a means to prepare for uncertainties in business and environmental conditions while ensuring product or service quality is maintained [16]. The primary emphasis lies on management's efforts to achieve sustainable production and sales activities while upholding customer satisfaction levels.

Regarding production, the Just-in-Time (JIT) approach is employed, fostering collaboration and cooperation among suppliers, manufacturing units, sales, and end customers [17]. The aim is to reduce costs by maintaining efficient supply without holding excessive inventory. Additionally, Product Life Cycle costing addresses product development and non-production costs. Research and development (R&D) costs are also considered.

In terms of pricing technique, the practice of Target Costing is implemented, where the cost of each activity is controlled relative to the total revenue expected to be generated from the willingness to pay for a given product [18, 19]. According to this view, organizational sustainability is not solely driven by existing profit but requires a deep understanding of customer expectations in terms of price and quality. This perspective mandates a comprehensive understanding of customer expectations beyond mere needs to ensure long-term sustainability.

Thailand has been struggling throughout the COVID-19 pandemic among all the sectors of the economy [20–22]. The various social, cultural, and economic factors have adversely affected the Thai population, resulting in reduced growth and development.

The conceptual framework of this research follows the qualitative approach towards the maximum interpretation of the collected data [23, 24]. The approach involved understanding the existing research gaps and then generating the research questions in accordance with the aim and objectives of the research (refer to Figure 1).

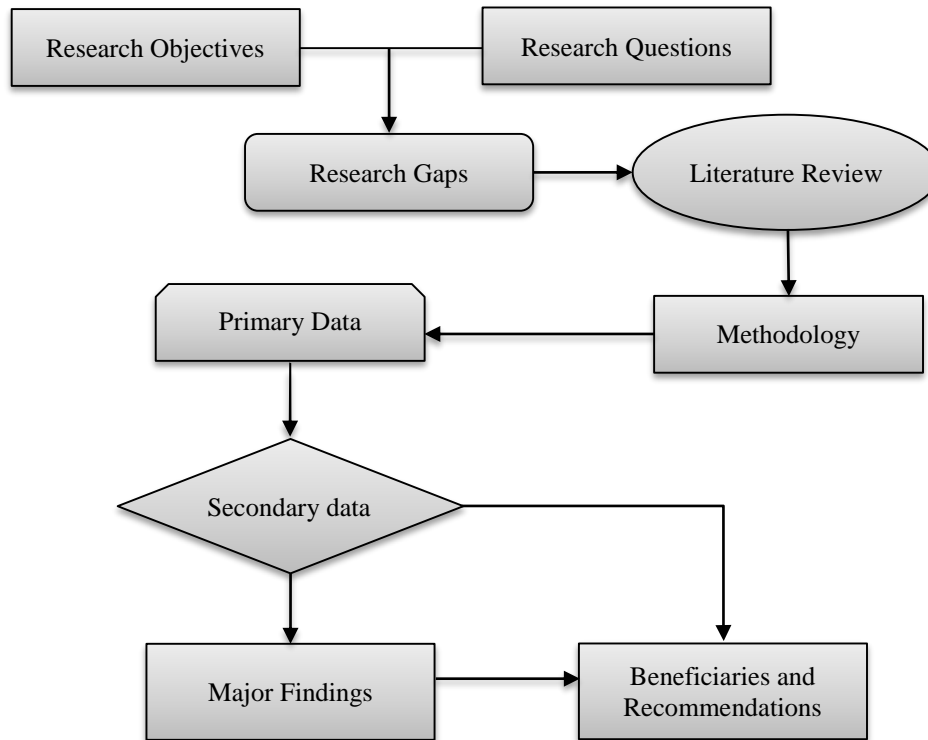


Figure 1. Conceptual framework for this research

The data collection and amalgamative impacts of existing literature upon the resilience and sustainability of Thai SMEs have been explored. The major findings not only provide contributions to the existing literature but also imply benefits for local communities and SMEs to strengthen the lifeline of the Thai economy.

Previous research has exhibited inadequacy in comprehensively addressing the integration of cost management and Supply Chain Management, and their joint impact on disaster-prone Small and Medium Enterprises [25, 26]. Therefore, the objective of this research is to address this gap by bridging the existing knowledge. It is crucial to enhance sustainability among the affected SMEs.

3- Methodological Approach

The methodology employed in this study utilizes a qualitative research approach. The data collection process consists of both primary and secondary data collection. For the primary data collection, a random purposive sampling technique was applied to select SMEs in Thailand affected by the COVID-19 pandemic. The sample size was determined through the Thai SME database, encompassing diverse SMEs and central industrial offices and factories situated in disaster-prone remote areas. These head offices play a significant role in decision-making processes that impact the entire country of Thailand. The initial investigation utilized the SME database provided by the OSMEP office [27].

The research adopts qualitative methods to ascertain and analyze the primary data collected through semi-structured interviews and the secondary data collected through various online and printed resource materials pertaining to SMEs in Thailand. The semi-structured interviews provided for the thematic discussions, along with understanding the inputs from the respondents. In-depth interviews provided detailed information about the gaps and issues pertaining to cost accounting and the inadequate supply chain management framework in Thailand.

The sample was ascertained among the SMEs that struggled during the COVID-19 pandemic and resulted in losses and damages. These were selected by adopting purposive sampling from the National Statistics Office and OSMEP to ensure the actual damage pertaining to the SME, with evidence from government-published reports [28, 29].

SMEs have been struggling in terms of maintaining the adequacy of costs and smooth supply chain management. The COVID-19 pandemic enhanced the vulnerabilities of these SMEs. Thailand has been adopting several policies to ensure assistance for these vulnerable SMEs. However, the uncertainties associated with COVID-19, especially the elongation of the pandemic, diminished the recovery capacities of the Thai SMEs. Accounting behavior has been under research for SMEs in the ASEAN region [30]. However, the sustainability of the vulnerable SMEs has been found to worsen due to the absence or reduction of the supply chain during the COVID-19 pandemic [31].

Content analysis provided for the stakeholder's cognitive perception and insightful behavior towards adequate decision-making to reduce disaster vulnerabilities, especially during the COVID-19 pandemic [32, 33]. The factors were

gathered through an extensive literature review and involved the construction of thematic layers, including cost accounting, supply chain management, disaster management, and recovery from the COVID-19 pandemic [34]. The literature review presented several research gaps, including the combined effects of inadequate cost accounting and supply chain management. However, the previous studies suggested that further multidisciplinary approaches and stakeholder perception research would widen the scope for an improvised and sustainable future for the vulnerable SMEs in Thailand.

A total of 25 key informant interviews were conducted to gather data, ensuring representation across various characteristics of respondents and comprehensive coverage of both society and the economy as a whole [35]. Data was collected through questionnaire surveys and key informant interviews, involving a diverse range of experiences from the affected SMEs (see Table 1). The data collection process involved employing sampling techniques and rigorous data collection and verification methods. Rigorous sampling techniques and data collection methods were adopted, with trained research assistant's adept at engaging with SMEs chosen based on their prior experience and proficiency in the domain.

Table 1. Sampling for this research

Serial Number	Characteristics of the Respondents	Number of Respondents
1	Business owners	4
2	Business owners and managers	4
3	Business managers	5
4	Employee (supply chain executives)	5
5	Employees (Accountant)	5
6	Government Officials	2
Total		25

The methodology employed in this study utilizes a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis to gain a comprehensive understanding of the factors influencing the sustainability of SMEs in Thailand. Expert opinions were sought to support the methodological approach. The selection of variables was based on a thorough review of relevant literature and field experiences.

4- Conducting Research and Results

The results from this research depicted and highlighted the gaps among the SME literature and essential revisions of the policy implications. The key themes are selected based on the previous literature and direct impacts upon the Thai SMEs (Refer Figure 2 and Table 2). The themes were directly affecting the levels of risk associated with business management during the COVID-19 pandemic.

- **Social:** The social aspect of the resilient SMEs is crucial for long term economic growth and development. The economic factors alone do not suffice towards societal development. The social theme provided for the in-depth understanding of the Thai society and comprehensive analysis of the interdependence of several thematic layers.
- **Cultural:** Thailand has a rich and flourishing culture which is an integral part of the Thai SMEs. The exploration of this theme assists in analytical approach towards enhanced cultural value added towards the Thai SMEs and economy as a whole.
- **Economic:** The economic valuation of SMEs is much higher than other enterprises in Thailand. The contribution towards GDP, employment generation, sustainable development through resilient enterprises has been crucial for the Thai economy. The growth and development are dependent upon wealth generation as well as adequate allocation of economic resources.
- **Vulnerability Assessment:** The vulnerability of the SMEs has several aspects. SMEs struggle from disruptive events and scenarios such as economic recession, COVID-19 pandemic and social and cultural changes in the long run. It is essential to assess the actual vulnerabilities of the SMEs to provide recommendations and enhance resilience among these vulnerable SMEs.
- **Disaster Recovery:** The disaster recovery of the SME, in terms of reducing the costs and adequately managing them, bouncing back to normalcy and regain smoother supply chain management, is essential to ensure the sustainability of the Thai economy.
- **Resilience:** It is not suggested that resilience should be treated as a short term or one time phenomenon. Resilience is an on-going process which ensures enhanced growth and development of the SMEs and communities. The resilience effect could be seen through the disaster recovery time period duration among the affected SMEs.

- **Cost Management:** The basic aim of this research is to adequately manage the cost and minimize it to ensure the effectiveness of the cost management system among the vulnerable SMEs. The Just-in-time, benchmarking and other cost related factors constitute as a thematic layer to have positive impact upon the sustainability of the SMEs in ever-changing business environment.
- **Supply Chain Management:** Logistics and supply chain management is the driving force for reinstating the economy and the community vulnerability reduction. These risks associated with the supply chain and logistics are essential to be minimized to ensure sustainable development.

In summary, research findings expose SME literature gaps, guiding crucial policy adjustments. Themes rooted in research and direct relevance to Thai SMEs underscore their influence on pandemic-driven business management risks. The enterprises faced challenges in maintaining resilience during the prolonged duration of the pandemic [36]. It was observed that the absence of appropriate cost management strategies made it difficult for enterprises to adapt. These challenges included temporary closures, strained customer and supplier relationships, limited government assistance, and a lack of initiatives to revive the Thai economy.

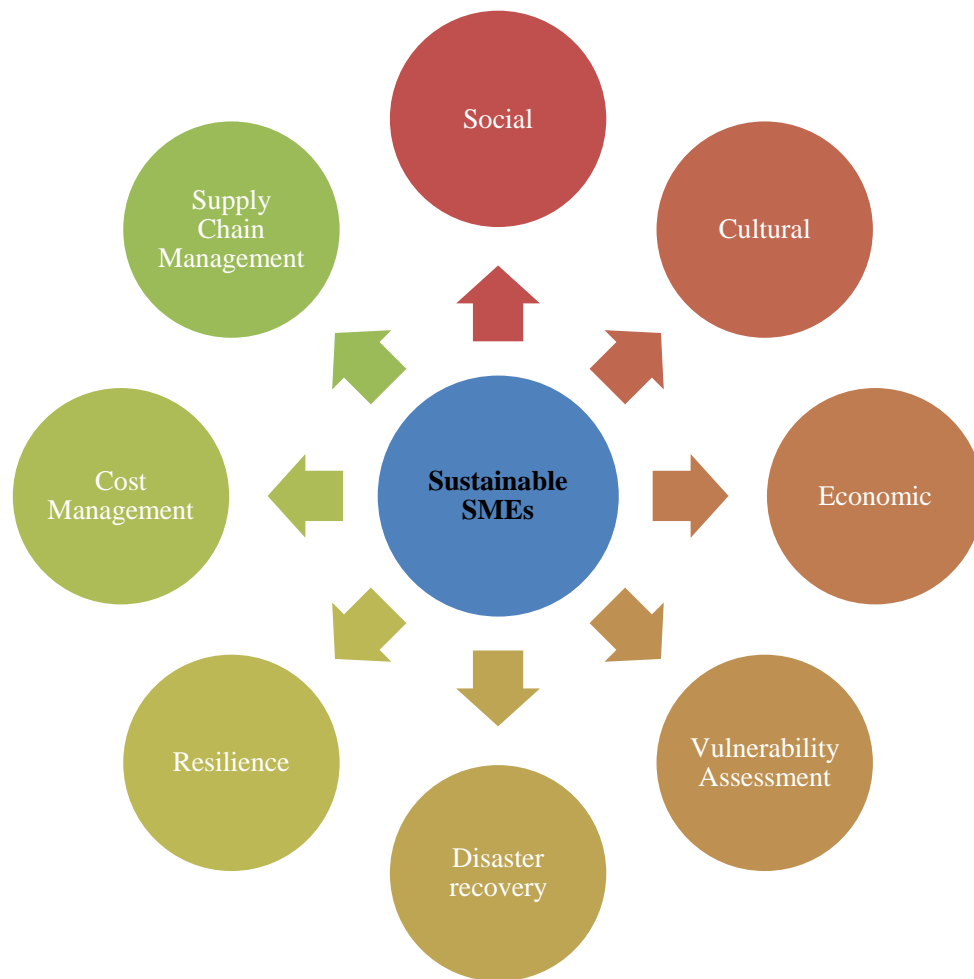


Figure 2. Thematic layers for this research

Table 2. Literature based factors for thematic analysis for this research

Serial Number	Themes	References
1	Social	Vongsraluang & Bhatisevi (2017) [37] and Chiranun Kamolsin (2023) [38]
2	Cultural	Rujirawanich et al. (2011) [39] and Khanthong (2023) [40]
3	Economic	Tevapitak & (Bert) Helmsing, (2023) [41] and Srisathan et al. (2023) [42]
4	Vulnerability assessment	Pathak & Ahmad (2016) [43] and Inpin & Dania (2023) [44]
5	Disaster recovery	Kato & Charoenrat (2018) [45] and Srihirunet al. (2023) [46]
6	Resilience	Mavrodieva et al. (2019) [47] and Apasrawirote & Yawised (2023) [48]
7	Cost management	Hasan et al. (2023) [49], Hansen (2021) [50], Blocher et al. (2019) [51], Galic et al. (2023) [52]
8	Supply chain management	Sawangwong & Chaopaisarn (2023) [53] and Banomyong & Supatn (2011) [54]

The selection of respondents for this study was based on their expertise and experiences in cost management and supply chain management. Key informant respondents were chosen among stakeholders with primary roles and responsibilities in these processes (see Table 3).

Table 3. Profile of the respondents

Serial Number	Designation	Sector	Professional expertise	Education level	Age group
1	Business owners	SME	Finance	Masters	40–50
2	Business owners and managers	SME	Management	Masters	40–50
3	Business managers	SME	Management	Masters	50–60
4	Employee (supply chain executives)	SME	Logistics	Masters	30–40
5	Employees (Accountant)	SME	Accountancy	Masters	40–50
6	Government Officials	Government	Policy implications	Masters	20–30

The collected data according to the themes have been analyzed through SWOT to assist the major findings from the research, Strengths, Weaknesses, Opportunities, and Threats. The Figure 3, presents a comprehensive SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis for this study. The following detailed observations are made for each sub-heading:

Strengths: Thailand possesses a well-defined and extensive network of existing disaster management frameworks at all levels of governance. However, the strategic implementation of these frameworks among SMEs is inadequate [10]. Both the government and SMEs have access to cost management strategies that, if effectively implemented, could help mitigate vulnerabilities. The smooth supply chain management was observed during the COVID-19 pandemic; however, it was inadequate in the remote locations in Thailand. The SMEs contribute largely to Thai economy and provide for social, economic and resilience.

Weaknesses: The SMEs exhibit insufficient risk perception, leading to a lack of contingency funds to manage uncertain risks. This weakness was particularly evident during the COVID-19 pandemic among Thai SMEs. The government channels did not provide adequate regulation, economic support and early warning among vulnerable SMEs. There was lack of coordination between various departments and it resulted in reduced support towards reducing cost and providing adequate supply chain in Thailand.

Opportunities: Thailand presents various opportunities, such as the existence of adequate disaster governance at all levels of government policy implications. Through stakeholder inclusion and the implementation of cost management strategies for a smooth supply chain, Thai SMEs can reduce their vulnerabilities to disasters. The opportunities extend in terms of social, cultural and economic benefit for the Thai SMEs and society as a whole.

Threats: Practical threats include an unstable political system, which exacerbates vulnerabilities to disasters in terms of civil unrest, public protests, inadequate policies, and insufficient disaster management implementations. The threats for the vulnerable SMEs range from local governance to national levels. The absence of stable government at the national levels and influence of other political stakeholders deems it ineffective to govern the policies during COVID-19 pandemic.

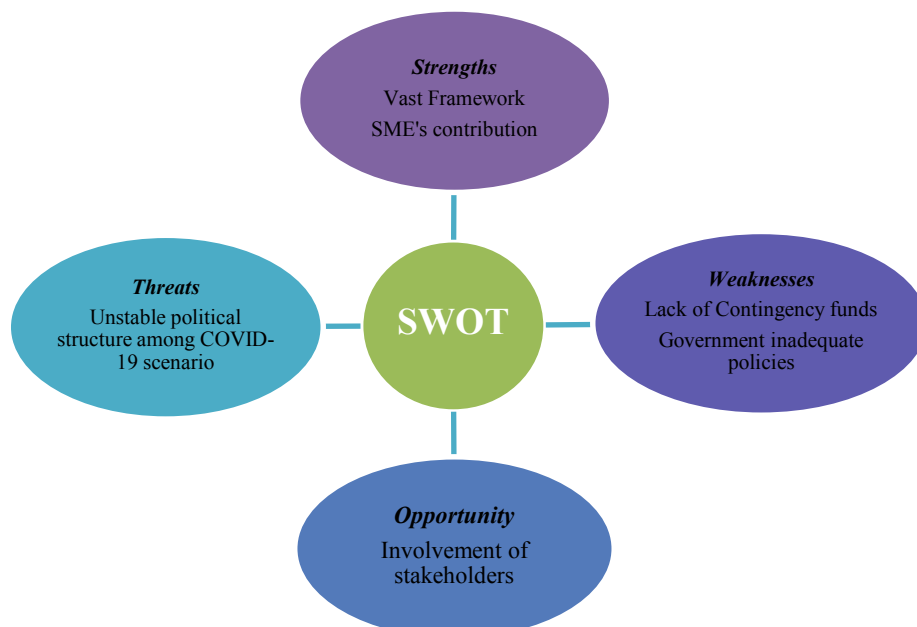


Figure 3. SWOT analysis for this study

The findings and results of this study shed light on the key factors necessary to initiate efficient disaster governance among SME management. The driving forces behind these factors underscore the importance of managerial decision-making at the SME level and the need for government policy implications at both local and national levels. Stakeholders play a crucial role in the resilience, development, growth, and overall progress of the Thai economy. However, the global COVID-19 pandemic revealed the failure of disaster management frameworks in most parts of the world [55, 56]. Stakeholders' involvement in strategic management of both costs and supply chains was found missing in Thai SMEs. This was due to the absence of coordination and collaboration between public and private stakeholders.

Suppliers emerge as major stakeholders, directly impacting both cost management and supply chain management. The ripple effect caused by disruptions in the supply chain negatively affected overall growth in the value chain. The suppliers found it hard to survive with reduced demand for most of the products; however, the sudden increase in demand for essential products challenged the maintenance of the supply chain with an enhanced cost of logistics in Thailand [57]. One respondent shared their experience, stating, "Suppliers are vital for all manufacturing activities. During COVID-19, we encountered difficulties in maintaining supplies as our suppliers faced financial constraints, resulting in delayed delivery of raw materials."

At the local level, the government sector demonstrates efficiency as a first responder in Thailand. Existing disaster response and recovery frameworks are operational. However, cooperation and understanding between government agencies and SMEs are lacking. This gap is evident in the absence of an SME database and a common platform for exchanging real-time issues. A government official added, "While the government took initiatives to boost the economy, SMEs were significantly affected as they spent more than their earnings. They should have maintained contingency funds to weather challenging times."

In 2019, SMEs were equipped with resources to tackle the first wave of the COVID-19 pandemic [58]. However, the sudden and severe second wave exposed vulnerable SMEs to financial deficiencies. Although SMEs were showing signs of recovery after December 2020, the subsequent wave in 2021 left them exposed to further uncertainties. One SME owner and manager expressed their struggle, saying, "It was incredibly challenging for me to handle the second wave of COVID-19. I was unprepared. It has been more than 1.5 years now. How can I manage costs, quality, and timely delivery?"

Cost management is not mandatory among SMEs, and the accounting federation in Thailand does not include accounting strategies to mitigate disaster losses. Amid COVID-19, SME accountants lacked knowledge of cost management strategies or government financial incentives. They were also unaware of financial incentives from the government and struggled due to the lack of miscellaneous funds that could have supported the SMEs during these difficult times. An accounting expert suggested: "The government must make it mandatory for companies to have contingency funds. Instead of community-based policies that impose additional financial burdens on SMEs, we should receive tax rebates."

According to the respondents, cost, quality, and timely supply chain management were the most difficult factors to control during the pandemic. Reducing costs and enhancing quality became challenging due to the focus on timely delivery. The risk assessment was found to be inadequate among the vulnerable Thai SMEs which was in line with previous studies [59]. Partial and complete lockdowns, even in industrial estates and non-residential areas, further exacerbated the situation. One SME manager commented, "Our motto is to reduce costs and maintain timely delivery of quality products. However, when we face complete or partial lockdowns due to the pandemic, things go beyond our control."

Government-initiated unplanned lockdowns created additional barriers for SMEs to maintain their operations. Respondents mentioned the adverse impact of competitive home deliveries or deliveries to clients, which increased total costs. One manager stated: "To ensure effective supply chain management, we need to incorporate cost management. Reducing costs will significantly contribute to profits. However, during the COVID-19 scenario, maintaining supplies becomes challenging. We focused more on home delivery to achieve customer satisfaction and sustain our orders."

Thailand has faced significant struggles during COVID-19, as its primary GDP-contributing sectors, such as tourism and agriculture, have been severely affected [60]. This directly impacts the financial and raw material supply chain for SMEs [61]. Additionally, the purchasing power and capacity of communities have decreased. Government initiatives, such as the 50% sales coverage for the food sector, only aided a specific industry, leaving SMEs without direct cost-reducing initiatives.

In terms of stakeholders, Thailand fails to utilize all available government and non-governmental financial and human resources [62]. There is a lack of communication between SMEs as a collective or at an individual level with village-level government disaster response and recovery agencies and centers.

The thematic layers in this study provided in-depth analysis of the social, cultural, economic, vulnerability assessment, disaster recovery, resilience, cost management and supply chain management. The risk for enhanced disaster

vulnerabilities among SMEs were found to be prevalent higher among the far flung and remote areas. The inability of the SMEs to adequately maintain strategic advantages of cost management resulted in higher operating costs. The supply chain was adversely affected by the inaccurate risk perception among the SMEs. The restriction from the government for mandatory lockdowns forced the SMEs to curb down their regular operation during COVID-19 pandemic. This directly reduced the supply chain channels for the SMEs.

Social and cultural factors were found to be positive and enhanced the capacities of the SMEs. The economic factor was found to be limiting due to uneven demand and supply levels. The employee and logistics teams were found to be supportive during the COVID-19 pandemic. However, SMEs were unable to cope with human resource costs and resulted in a reduction of employees. This affected the business operations and enhanced their vulnerabilities for recovering faster after COVID-19 subsided [63].

Policy level implications could motivate and provide guidance for SMEs to better prepare for uncertain disaster scenarios. SMEs were found to be unaware of the potential assistance they could have accessed, such as stakeholder involvement and collaboration with local communities and government entities. Effective integration of cost management and supply chain management is crucial for reducing costs, maintaining quality, and ensuring timely delivery.

5- Conclusion

The complexities of the combined effects of various factors studied under this research call for robust and effective policy implications. The rich social and cultural backdrop in Thailand would enhance the economic growth of Thai SMEs with adequate policy recommendations. The costs have been a crucial variable with a significant impact on the enhanced vulnerability of SMEs. The increased production logistics costs acted as a barrier for Thai SMEs to strategically deal with the COVID-19 pandemic. The study found that effective cost management and adequate supply chain management empower SMEs, along with opportunities to grow and develop. The beneficiaries would be the local communities, the overall development of the SMEs, and the economy as a whole. The COVID-19 pandemic may have subsided recently; however, the lessons taught during this pandemic would enhance the strategic management of SMEs and resilience in the long run. Effective supply chain management relies on the involvement of various stakeholders, efficient business processes, relationship management, and cost management. The findings highlight the urgent need for governments and enterprises to take immediate initiatives in order to ensure sustainability in the face of catastrophic events like the COVID-19 pandemic.

5-1- Recommendation for the Government

Effective disaster governance should encompass support for SMEs at both the local and national levels. This includes the implementation of awareness campaigns and the establishment of a comprehensive disaster database to assess the actual impact and specific requirements of SMEs. Policy-level implications should be considered to ensure safe and efficient logistics and value chain operations during lockdown periods. Additionally, providing financial assistance and offering tax incentives are crucial measures to promote the survival and resilience of SMEs.

5-2- Recommendations

Based upon this research, the following research recommendations must be made:

- Conduct in-depth research on amalgamated and comprehensive planning strategies for both cost management and supply chain management at internal levels. Investigate how effective integration of these two aspects can enhance the overall operational efficiency and resilience of SMEs.
- Explore cost management strategies across all levels of business activities, including production, distribution, and accountancy. Examine the potential impact of cost reduction measures on improving the financial stability and competitiveness of SMEs.
- Investigate strategies for enhanced supplier and customer relationship management, specifically focusing on COVID-19 pandemic recovery assistance for suppliers and implementing home delivery with proper sanitization measures for customers. Assess the effectiveness of these strategies in maintaining supply chain continuity and customer satisfaction.
- Examine the importance of contingency funds in preparing SMEs for unforeseen and uncertain disaster scenarios, considering that the COVID-19 pandemic does not have a definitive expiration date. Explore the impact of having contingency funds on SMEs' ability to withstand and recover from crises.

Furthermore, this research opens avenues for further investigation, particularly in the context of micro-level logistics enterprises and the revival and survival strategies of non-manufacturing local enterprises. For example, conducting research on the tourism sector in Thailand in relation to other sectors' SMEs can contribute to existing literature and provide valuable insights into the challenges and opportunities faced by the tourism industry in the wake of the COVID-19 pandemic.

6- Declarations

6-1-Author Contributions

Conceptualization, T.S. and S.P.; methodology, S.P.; software, T.S.; validation, T.S., S.P., and Y.H.; formal analysis, T.S. and S.P.; investigation, T.S. and S.P.; resources, T.S. and S.P.; data curation, T.S. and S.P.; writing—original draft preparation, T.S. and S.P.; writing—review and editing, T.S., S.P., and Y.H.; visualization, T.S. and S.P.; supervision, T.S. and S.P.; project administration, T.S. and S.P.; funding acquisition, T.S. and S.P. All authors have read and agreed to the published version of the manuscript.

6-2-Data Availability Statement

Data sharing is not applicable to this article.

6-3-Funding

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6-4-Acknowledgements

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6-5-Institutional Review Board Statement

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6-6-Informed Consent Statement

Informed consent was acquired from all the research participants.

6-7-Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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Appendix I: Questionnaire



Questionnaire

Hello, We are conducting a research on Small and Medium Enterprises (SMEs) effect on the business from disasters and would like to interact time with you on issues relating your business's supply chain management and strategic cost management for sustainable strategies. Whatever information you will provide us will be treated as **confidential**. No information in the written report will be attributed to your identity or personality.

Agree	Ask to return
-------	---------------

Date				Name of SME head	
Location				Interviewer	
Checked (If not present)				Entered	

Instruction: Please Answer the Following Questions Completely and Please circle one number on each question only.

1. Information about Business

a) Business Registration

- () Single Business Owner () Partnership
() Limited Liability Company () Other.....

b) Type of Business

- () Manufacturing () Service
() Wholesaling () Retailing

c) Year Established

- () Less than 1 year () 1-5 Years
() 6-10 Year () more than 10 Years

d) Annual Income

- () Not over 50 Million Baht () 51-100 Million Baht
() 101-300 Million Baht () More than 300 Million Baht

e) Number of Employees

- () Not over 30 workers () 31-50 workers
() 51-100 workers () More than 100 workers

f) Does your enterprise export?

- () Yes () No

2. Disaster preparedness of the Enterprise

a) Did you have disaster mitigation structural measures such as facemasks before the Covid 19 in your enterprise?

- () Yes () No

b) Did you have disaster mitigation structural measures such as compulsory facemasks now in your enterprise?

- () Yes () No

c) Did you think you were prepared for disaster before Covid 19?

- () Yes () No

d) Do you have temporary operational facility in case of Covid 19?

☐ Yes ☐ No

e) Did your enterprise have insurance for disasters before Covid 19 for disasters?

☐ Yes ☐ No kindly give reasons for your answer.....

3. Employee profile

a) What percent of employees used to live outside the enterprise premises during the Covid 19? (Please circle one number only)

☐ Below 10% ☐ 11% to 30%
☐ 31% to 50% ☐ Higher than 50%

b) What percent of employees live outside the enterprise premises now? (Please circle one number only)

☐ Below 10% ☐ 11% to 30% ☐ 31% to 50% ☐ Higher than 50%

c) What is the average age group of employees? (Please circle one number only)

☐ Not over 20 years ☐ 21 to 35 years
☐ 36 to 50 years ☐ Older than 50 years

d) What percent of employees are willing to work during the Covid 19? (Please circle one number only)

☐ Below 10% ☐ 11% to 30%
☐ 31% to 50% ☐ Higher than 50%

e) What percent of skilled employees did the enterprise lose by the Covid 19? (Please circle one number only)

☐ Below 10% ☐ 11% to 30%
☐ 31% to 50% ☐ Higher than 50%

4. Production

a) What was the level of production in the year 2019?

.....

b) What is the current level of production?

.....

c) How long was the production closed in your enterprise during the Covid 19? (In days).

.....

d) What were the damage to following during the Covid 19:

Machinery.....

Infrastructure.....

Other assets.....

e) What were the recovery strategy for following after the Covid 19:

Machinery.....

Infrastructure.....

Other assets.....

5. Sales

a) What was the value of sales in the year 2019

.....

b) What is the current value of sales

.....

c) *Do you have alternative markets/selling place during the Covid 19?*

() Yes () No If Yes then where?.....

d) *How do you deal with perishable products (if any)*

.....

e) *How did you transport your products during the Covid 19 from your enterprise?*

.....

6. Stocks/Inventory

a) *Do you have your own warehouse/storage facility or is it rented?*

b) *How was it affected by Covid 19? (Please circle number/numbers)*

() Severely () Moderately () No impact

c) *What is your current status in storing products:(Please circle number/numbers)*

() own facility () rented facility () No storage facility

d) *What improvements have you made in storing products after the Covid 19? (Please circle number/numbers)*

() Some improvement () No improvement () deteriorated

e) *Did you have insurance for the stock before the Covid 19?*

() Yes () No If Yes then how much?.....

7. Finance

a) *How much was the total economic/ monetary loss (in Baht) to your enterprise from the Covid 19?*

.....

b) *How much financial assistance (in Baht) did you require to fully recover from the Covid 19?*

.....

c) *Did you find obtaining finance as a major difficulty for the enterprise after the Covid 19?*

.....

d) *Do you feel that personal relationships with bankers are important to the enterprise to have ease of access to credit:*

() Loan was available

() Qualifying for credit was easier

() You got successful in attaining loan

e) *If you needed money what options did you explore:*

() Bank () Friend

() Relatives () Others (please Specify).....

8. Social Impacts of Covid 19

a) *Are you aware of corporate social responsibility (C.S.R.)? () Yes () No*

b) *If yes then did you take part in any of the C.S.R. activities?*

.....

c) *Did you and your employee take part in any of the disaster mitigation measures after the Covid 19?*

() Yes () No If Yes please give details.....

d) *Do you monitor or inspect the safety standard in your enterprise after the Covid 19?*

() Yes () No

e) *Do you think that after repairing your enterprise after Covid 19, it is healthier and safer?*

() Yes () No If yes then kindly give details.....

9. Government policies for Covid 19

a) What is your assessment on the government's response to Covid 19?

☐ Satisfactory ☐ Good ☐ Not enough

b) What is your assessment on the preparedness for future Covid 19?

☐ Satisfactory ☐ Good ☐ Not enough

c) When do you get official Covid-19 warning? (Please circle one number only)

- ☐ when the Covid 19 was avoidable
☐ before the Covid 19 had affected the location
☐ after the Covid 19 had devastated the enterprise
☐ I never received Covid 19 warning

d) What are the various assistances you need in a future disaster event (in order of priority)

- 1).....
 2).....

e) Did you face difficulty in protecting your goods/stock/livestock from the Covid 19?

☐ Yes ☐ No

10. Recovery from Covid 19

a) How much time the enterprise took to fully recover from Covid 19?

.....

b) How much external resources (in baht) were used for full recovery of the enterprise?

- ☐ 0-9,999 ☐ 10,000-99,999
☐ 100,000-999,999 ☐ 1000,000+

c) In what way have you responded to Covid 19?

- ☐ Selling assets
☐ Borrowing money or food
☐ Reducing business expenditure
☐ Seeking help from other people
☐ Starting a new livelihood activity (with example)
☐ Using insurance as a recovery mechanism
☐ Enterprise member moving away to seek job for income
☐ Offering labor to others

d) How prepared were the following groups for the Covid 19?	Not prepared at all	Not very prepared	Somewhat prepared	Very prepared	Unsure
Your SME					
Local Government					
State Government					
Other organizations (NGOs, etc.)					

e) To what extent might the following prevent your enterprise from preparing for the Covid-19 recovery?	Low	Low-Medium	Medium	Medium-High	High
Cost					
Skills require to prepare					
Other priority compared to flood risk management					
Need for Cooperation with others stakeholders					

11. Strategic Management Accounting (SMA)

a) Which of the following Strategic Management Accounting (SMA) tools are used by your company? (Check all that apply)

- ☐ Competitor cost assessment
- ☐ Customer profitability analysis
- ☐ Integrated performance measurement – balanced scorecard
- ☐ Strategic cost management
- ☐ Strategic pricing
- ☐ Benchmarking
- ☐ Other (please specify)

b) Which of the following tools would add value to gain competitive advantage by the company? (Check all that apply)

- ☐ Competitor cost assessment
- ☐ Customer profitability analysis
- ☐ Integrated performance measurement – balanced scorecard
- ☐ Strategic cost management
- ☐ Strategic pricing
- ☐ Benchmarking
- ☐ Other (please specify)

c) Would you consider implementation of SMA tools on large scale in the company and why?

- ☐ Yes
- ☐ No (Please enter comment)

d) Are SMA tools cost effective?

- ☐ Yes, always
- ☐ Yes, in long term
- ☐ No, never
- ☐ Other (please specify)

e) In which of the following market structures the SMA tools would be the most effective in gaining competitive advantage? (Check all that apply)

- ☐ Mature market – few competitors
- ☐ Mature market – many competitors
- ☐ Emerging market – few competitors
- ☐ Emerging market – many competitors
- ☐ Other (please specify)

f) In which of the following product structures the SMA tools would be the most effective in gaining competitive advantage? (Check all that apply)

- ☐ Many products – many competitors
- ☐ Few products – many competitors
- ☐ Many products – few competitors
- ☐ Few products – few competitors
- ☐ Other (please specify)

g) Is the effectiveness of SMA tools dependent on the size of the company? (Check all that apply)

- ☐ Yes, best for large corporations
- ☐ Yes, best for medium size companies
- ☐ Yes, best for small companies
- ☐ No, it doesn't depend on the size of company
- ☐ Other (please specify)

h) What are the main advantages of SMA tools to gain competitive advantage? (Check all that apply)

- ☐ Provide insight knowledge of competitors
- ☐ Provide detailed cost analysis
- ☐ Support strategic pricing management
- ☐ Support strategic decision making
- ☐ Strategic pricing
- ☐ Provide useful non-financial data
- ☐ Other (please specify)

i) What are the main disadvantages of SMA tools to gain competitive advantage? (Check all that apply)

- ☐ Expensive, complicated and time consuming implementation
- ☐ Expensive, complicated and time consuming maintenance of up to date data
- ☐ Inaccurate competitors' information
- ☐ Outdated and inaccurate competitors' pricing and costing analysis
- ☐ Cost outweigh benefits
- ☐ Other (please specify)