

Sustainable Supply chain Systems of Food and Beverages SMEs: Analyzing sustainable performance using Structural Equation Modeling

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Abstract

The research aims to identify Critical success factor for sustainable supply chain Management (SSCM) systems of food and beverages (F&B) SMEs. Firstly the critical success factors were identified using systematic literature review, further Structural Equation modeling has been done to analysed whether SSCM. The realistic insights presented in this study have the opportunity to further improve knowledge of the implementation of SSCM practices not only within the boundary of industry, but also to expand them to their supply chains. The aim of this research is to analyses whether SSCM practices are implemented at all stages in F&B SME's supply chain. The research leads to the supportable supply chain management information by identifying CSF and developing SSCM model to sustainable growth of firm.

Keywords: SMEs, Food and Beverages; Sustainable Supply Chain Management

1. Introduction

The global economic contribution of SMEs is more than 90% (Ali Abbasi et al., 2022; Al-Weshah et al., 2022). Since businesses now concentrate more on their core competencies, their trust is more on the providers with the supply chain subcontracting undertakings. Thus SMEs are creating significant strategic supplier advantages (Aldaas et al., 2022; Aggarwal, and Joshi, 2014a). The efficiency of contractors obviously directly affects organizations' goods, and the long-term supplier capacity affects the competitiveness of enterprises (Aggarwal, and Joshi, 2014b; Araújo et al., 2022; Joshi et al., 2020b). SME firms' active participation in business environment has an increasingly important effect on supply chain efficiency. It can

fulfill the positions of manufacturers, distributors, manufacturers, and consumers (Artin, 2022; Kamble et al., 2019). Sensitivity to market change (Bag et al., 2021), versatility to meet consumer requests (Ismail, 2022), and quick decision building in performance (Bailey, and Breslin, 2021; Joshi et al., 2020b) had made small and medium-sized businesses candidates for increasingly evolving customer demands and rapidly increasing technological advances. Owing to constraints on the sizes, services, and other traditional features relative to LEs in the supply chain, SME firms have minimal comparative edge and, therefore, are more susceptible (Baral et al., 2021). Notwithstanding the significant amount of SMEs and the vital role they play in supply chains, there is still limited and scattered writings in SMEs and Supply Chain Management practices (Bocken, and Geradts, 2020), mainly qualitative cases of research (Bodenheimer and Leidenberger, 2020; Joshi, S., Sharma, M., & Singh, R. K. (2020a).). Research into SMEs and SCM tactics has great potential, particularly SMEs' capacity, and sustainability, to satisfy varying demand in SMEs' supply chain (Bui et al., 2021; Joshi et al., 2021).

1.1 SMEs in developing countries

For emerging economies like India, these barriers could be different to the economic growth in Global Competitiveness Ranking. Recent research recommends incorporation of Sustainable development in planning and decision making processes to create Sustainable enterprises. The potential of such enterprises can be understood by risk adaption, global coverage (Canhoto et al., 2021; Joshi and Sharma, 2021b). Sustainability has risen to prominence in recent decades as companies aggressively seek comparative benefit in a volatile global climate (Carter et al., 2020). The term "preservation" or "sustained development" has already been made popular in almost any areas of culture, such as government (Chen, and Chai, 2010), local and global environment, and global societies (Choi et al., 2016). Recent studies focus on Corporate Social Accountability in Supply Chain Management have illuminated similar concerns (Chowdhury and Paul, 2020), which remain accessible thus far including corporate social, environmental and financial or economic success (Chowdhury et al., 2021). The present study aim to bridge this research gap.

1.2 Sustainability among SMEs

With ever-increasing concerns about environmental stability, the problems facing F&B category SMEs in the production zone are increasing (Conz and Magnani, 2020). Corrales-Estrada et al. (2021) stated environmental awareness continues to affect business strategies in the 21st century. The lack of organizational skills in SME firm appears to be part of the GSCM framework (Joshi, and Sharma, 2021a).

2. Literature review

Basis the search on Web of Science, for the term "Supply chain Management" and "Small and Medium Enterprises" AND "Sustainability" 588 documents between time period 1984-2020 were found and reviewed. The SMEs field has a vital role in all countries' economies around the globe. These organizations are the foundation for the expansion of national and foreign markets. In the current volatile and unpredictable marketplace conditions, the introduction of effective tactics is an incredibly vital endeavor to support SMEs' development (Sharma, & Joshi, 2020). In this sense, using the principle of SSCM in the Small and Medium Business Organizational Strategy appears to be an essential aspect. Various dimensions of Sustainable Development are also protected by this supply chain: financial, ecosystem and people oriented. The commitment of this study is to understand the existing state of the study related to the supply chain management of small and medium-sized companies and the research evidence in this area. The results

showed that, despite the literature's difference, all sustainability fields were significant in the SCM of the F&B SMEs studied. The research also includes the most significant elements for the basic sustainable areas of supply chain management and SMEs during the uncertainty (Joshi and Sharma, 2018 ; Sharma, and Joshi, 2021). In developing countries like India and China, businesses are under immense pressure to integrate Sustainable Supply Chain Practices (SSCPs) in the traditional Supply Chains (Dolgui, and Ivanov, 2021). The study aims to examine the challenges to the adoption of Sustainable Supply Chain Practices (SSCPs) in SMEs in India. Within the context of SMEs, the idea of sustainability in decision-making strategies has become increasingly relevant. The competitiveness and volatility of the environment often has critical role in identifying best practices to attain sustainability while integrating economic, environmental and social priorities in the Supply Chain process (Finsterwalder, and Kuppelwieser, 2020; Joshi, 2018; Sharma, M., Joshi, and Govindan, 2021). With rising regulatory and market pressure to adopt green practices, small and medium-sized companies face immense challenges in order to both boost their supply chains' organizational and green efficiency. The results of this study show that while several Small and Medium-sized establishments recognize the value of green practices, they have incomplete data to implement these practices in order to enhance their operational efficiency. Incorporation and configuration of green operations with initiatives for organizational improvement are defined as serious issues for establishing a successful green supply chain (Foo et al., 2018; Sharma et al., 2020a). Majority of F&B SMEs are privately held businesses and seldom actively seek study and publishing of effective practices, it is not easy to find success stories in the implementation of sustainability (Ghosh et al., 2021).

3. Material and Methods

3.1 Data Collection

Thirty training professionals received a suggested list of questions. Multiple refinements were done based on the feedback obtained, and the concluding survey was drawn up. Each set of questions was focused on 20 primary performance drivers established by business professional guidance and related literature (Gregurec et al., 2021; Gupta et al., 2021; Handfield et al., 2020; Haneberg, 2021; Hazen et al., 2015; Joshi, and Joshi, 2016). The selection of statistical technique is primarily based on the tools associated with data processing, in specific time and resources, the expertise of the researcher and the degree of certainty needed (He et al., 2020). The data collection is being done under the broader category of economic, social and environmental perspective.

3.2 Economic activities towards Sustainable Supply Chain Management

Besides that, in the study of the market elements of the efficient administration of supply chains, attention should be given to the movements of products, knowledge, and resources. To maximize the supply chain's reliability, the participants of the chain collectively control the transportation and storage of such movements (Hendiani et al., 2020; Joshi, 2015b; Sharma et al., 2020b).). Conversely, they would hand over these roles to other representatives. In either context, timely supply is key to sustainable supply chain management. The efficient material flow within the supply chain can be well accomplished concerning adapting the development, transportation, and marketing of its products and other relevant activities (Hernández-Linares et al., 2021). Supply chain members must produce innovative brands and exchange traditional components and procedures in order to adapt rapidly to changes in the size and specification of the product offerings (Hong et al., 2018).

3.3 Environmental Activities towards Sustainable Supply Chain Management

The ecosystem is a critical factor of economic growth; climate change, global warming and growing oil costs are key issues. Environmental protection in the context of environment concerns the preservation of continued access to natural capital, i.e. minerals and the ecosystem, for which there would be no human life (Isnain et al.,2020; Joshi, 2015a). In this sense, sustainable growth focuses on the protection of the raw material supplies needed to satisfy social needs (Joshi et al., 2013). Subsequently, as indicated in the previous studies, the sustainable concept of effective growth could involve environmentally friendly production practices and attempts to minimize waste generation. The contribution to sustainable manufacturing practices frees businesses from the release of contaminants.

3.4 Social activities towards Sustainable Supply Chain Management

Social, environmental sustainability includes a wide variety of civil rights and growth connections, such as the effect of corporate activities on people and world poverty, contradictory market practices, and consumer choice without a moral sense (Joshi et al., 2018)). Taking into consideration the community of people, it is necessary to acknowledge a variety of aspects that are significant to environmental growth and deserving of research, e.g. social effect mechanisms and projects relating to the potential to assess the social sustainability of distribution networks. In addition, the following aspects are important for the study of the involvement of SMEs in the supply chain network, taking into account social sustainability. Supply chain management's critical success factors (CSFs) reflect a wide range of techniques dedicated to an organisation's sustainability. Too many studies have attempted to define essential supply chain management success factors for an organisation's sustainability. (Joshi et al., 2020a) indicated that thirteen supply chain management CSFs are available at Indian F&B SMEs (Joshi et al., 2017). It is noted that this study focuses only on four aspects of customer service efficiency and satisfaction, innovation and development, financial efficiency and Indian F&B SMEs' internal business. The list of critical factors are broadly adopted from Verma et al. (2022) stated in Table 1. The paper established a theoretical framework based on several ground theories including Resource based view, Stakeholder theory, and Institutional theory and Transaction cost theory.

Table 1: Critical success factors for Sustainable supply chains of F&B SMEs

S.No.	Critical Success Factors (CSFs)	Author(s)
<i>Vision and commitment towards sustainability</i>		
1.	Vision and sustainable plan by top level managers	Joshi et al. (2020); Lu et al., (2021)
2.	Long range planning	Joshi, S. et al. (2018); Luthra et al. (2022); Prakash et al (2020);Sharma et al. (2022); Luthra et al., (2021)
3.	Brand Equity	Joshi et al. (2017); M'zungu et al. (2019) Machek, et al., (2021); Sharma et al., (2009)
4.	Manpower deployment	Sharma et al. (2021); Matos et al. (2020)
5.	Survivability Strategies	Prasad et al. (2015); Mani et al., 2020)
6.	Core competencies	Mathivathanan et al.,(2017); Majumdar et al.,(2020)
7.	Development of effective SCM strategy	Moretto and Caniato (2021)

8. Research and Development plans and investments	Namdar et al., (2021)
9. Capital asset acquisition plans	Joshi, S. (2018); Sharma et al., (2021); Nayal et al., (2021)
10. Process Standardization	Joshi, S., & Sharma, M. (2014); Namdar et al., (2021)
11. Procurement processes	Nasir et al., (2021); Namdar et al., (2021)
<i>Legal regulations</i>	
12. Central agencies' regulatory guidelines	Mathivathanan et al.,(2017); Majumdar et al.,(2020)
13. State agencies' regulatory guidelines	Joshi and Sharma(2021a); Namdar et al., (2021) Sharma et al.,(2022a).
14. Policy and plans by regulatory bodies	Joshi and Sharma (2021b); Namdar et al., (2021) Sharma et al (2021). Sharma et al., (2022b).
15. Technological aids by government for R&D- Policy and procedures	Joshi et al (2022); Namdar et al., (2021) Papadopoulos et al. (2020)
16. Institutional Pressure	Joshi et al. (2021); Namdar et al., (2021) Padhi et al.(2018)
<i>Sustainable Practices among SMEs</i>	
17. Sustainable Supply Chain initiatives and relevant policies	Joshi, et al (2022); Papadopoulos et al., (2020); Patma et al., (2021); Qvarfordt and Aadan (2021)
18. Sustainable suppliers selection	Sharma et al. (2021); Prakash et al. (2020)
19. Sustainable supply chain practices	Sharma et al. (2021); Sharma et al., (2022).
20. Employee commitment towards sustainable practices	Joshi et al (2022); Qvarfordt and Aadan (2021)
21. Sustainable supply chain designs	Mathivathanan et al.,(2017); Majumdar et al.,(2020)
22. Sustainable Manufacturing	Agarwal et al., 2020; Sharma et al. (2022b)
23. Green purchasing Practices	Joshi et al (2022); Joshi et al (2019); Sharma, M., Luthra, S., Joshi, S., & Kumar, A. (2021).
24. Sustainable organizational culture	
25. Peer pressure to deploy Sustainable Practices Information exchange	Joshi et al. (2017). Prakash et al. (2020)
26. Information exchange among suppliers	Joshi, et al. (2020a). Prasad et al.(2015)
27. Technology transfer	Prasad et al.(2015) Rameshwar and Joshi (2018).
28. Encouragement to technology advancement and adoption	Joshi et al. (2020b). Pu et al. (2021)
29. Technical know-how and training of entrepreneur	Ramos et al. (2021)
30. IT enabled system support	Sharma et al. (2009) Rameshwar and Joshi (2018).
<i>Inter-departmental cooperation/ Internal business performance</i>	
31. Encouragement from customers	Sharma et al.(2022); Sharma et al. (2022a) Rana, and Joshi (2020).
32. Workplace management	Joshi et al (2022); Joshi et al (2019) Pu et al., (2021)
33. Supply chain members' awareness and literacy	Kamble et al. (2019); Robertson et al.,(2021)

34.	Awareness level of customers	Joshi et al (2022); Joshi et al (2019); Robertson et al.(2021)
35.	Economic benefits	Ruel et al. (2021)
36.	Firm's competitiveness	Prasad et al.,(2015); Shahi et al. (2021)
37.	Logistics synchronization	Sabuj et al. (2021); Shahi et al. (2021)
38.	Higher flexibility in production system	Schleper et al. (2021); Shahi et al. (2021)
39.	Development of reliable suppliers	Sharma et al. (2022a); Sarkis, J. (2021)
40.	Developing just in time (JIT) capabilities in system	Shahid, et al. (2021); Shanker et al., (2021)
41.	Trust development in SC partners	Joshi et al (2022); Joshi et al (2019); Verma et al. (2022)
42.	Forecasting of demand on point of sale (POS)	Sharma, and Joshi (2019a); Udofia et al., (2021); Zhang et al., (2019)
43.	Prior working experience and occupational background	Franke et al., (2020); Choi et al., (2020); Rowston et al., (2020)
44.	Enforcement	Shantanu Rajora et al., (2018); Sharma et al., (2019).
45.	Unity of Command	He and Zhu, (2020); Yong et al., 2020) Wang et al. (2022).; Zaridis et al.. (2021)
46.	Compliance Management	Sharma and Joshi (2012); Turken, and Geda (2020)
47.	Effective Communication	Sharma et al. (2022a);Sharma, and Joshi.(2019b); Troise et al.,(2022)
<i>Sustainable Environmental Reporting</i>		
48.	Environmental Planning	Sharma et al. (2022a); Sharma and Joshi (2019a).
49.	Corporate responsibility and good governance	Joshi et al (2022); Joshi et al (2019)
50.	Environmental policy	Sharma et al. (2022a);Sharma, M., & Joshi, S. (2019b). Teece (2021)
51.	hazardous and waste material planning	Sharma et al. (2020b); Tong et al (2022); Yu et al (2019)
<hr/> Networks/ Linkages <hr/>		
52.	Supply Chain Network	Wang et al (2021); Yacob et al. (2018); Yang et al., (2021)
53.	SME consortium	Joshi et al (2022);Joshi et al (2019); Sharma et al. (2021). Sharma and Joshi (2019b).
54.	Industry- Academia Collaboration	Tondolo and Bitencourt, (2014); Tsai et al., (2022).
55.	Marketing Management (Global and Local)	Sharma, and Joshi (2012); Tranfield et al.(2003); Tsai et al (2022).
<hr/> Resources <hr/>		
56.	Project planning and scheduling	Stekelorum,(2020); Teece (2014)
57.	natural Resource Planning	Sharma et al. (2020a); Tripathi and Joshi (2019); Yi et al.,(2019)
58.	Owned/ Owed Resources	Sharma et al (2019).

A holistic system of market, environmental and social concerns is an essential feature of supply chain management practices and its application (Ketchen and Craighead, 2020)

4. Illustrative example and results

Based on the table 1, A structured questionnaire was prepared for executing the model. Which had following variables:

- a) External pressure on the firm
- b) Sustainable strategic operations of the firm
- c) Sustainable supplier management practices of the firm
- d) Sustainable operations management practices
- e) Sustainable practices in F&B SMEs
- f) Sustainable operations management practices (social performance) of the firm.
- g) Economic enactment of the firm.
- h) Environmental functioning of the firm
- i) Social presentation of the firm.

The total number of constructs in the questionnaire was 62. The sample size of the 280. To analyze the hypothesis of the study Structural equation modeling as performed on the IBM SPSS AMOS. A model was prepared on the basis of initial theoretical model. For putting the variables in the model. The value of cronbach's alpha was found to be greater than .7, which shows that the data is reliable. For validation check of the model we check Average variance extracted (AVE) and the aggregate value was found above .5. Also, the calculated discriminant validity was found under the acceptance levels. The value of CMIN/df was calculated as 3.548 which is below the prescribed value of 5, which indicates the values of a good model fit. Whereas RMR is calculated as 0.42, GFI as .946, AGFI as .922, and PGFI as .920, which overall indicates the good fit for the model.

5. Managerial implication and conclusions

The Indian F&B SMEs are experiencing major challenges in market climate to strengthen its sustainability performance while enhancing its revenues (Juergensen et al, 2020). Nonetheless, SMEs are in an even more difficult position in this market. They are aggressive to thrive in intense opposition with large corporations, whilst also being blamed for poor environmental results by both domestic and international clients (Karmaker et al., 2021). The existing landscape of F&B SMEs' management practices and its influence on organisational efficiency can be drawn on the base of the empirical outcomes of this report. This research finds that SMEs in an Indian manufacturing industry are mindful of the importance of environmental practices for businesses and individuals. They understood the effect of environmental practices on firm performance. Price is therefore one of several major components that perform a crucial role when implementing sustainability practices more broadly. One of the barriers to effectively adopting these practices is a lack of awareness about the best approach to implementing sustainable practices (Ju, et al., 2016). In addition, there is limited debate among scholars on how to interpret the effect of sustainable practices on operational efficiency, particularly with regard to small and medium-sized establishments in emerging nations (Klassen et al., 2012) The purpose of this study is just to define the key performance indicators and their effect on the efficiency of small and medium-sized companies for sustainable practices and also analyses the viability of the model established in this report. To develop awareness of the condition of the supply chain in the manufacture of SMEs and for direct potential analysis (Karim et al., 2021). No

previous reading considered all three features (environmental financial, and communal) of sustainable supply chain management in an extensive way in a particular region i.e., Uttarakhand, India. The research leads to the supportable supply chain management information by developing SSCM model to sustainable growth of F&B SME firms.

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