

**ANALYSING SUPPLY CHAIN SUSTAINABILITY CHALLENGES IN THE
AUSTRALIAN FOOD PROCESSING SECTOR DUE TO THE COVID-19
OUTBREAK**

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the degree of

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under the supervision of Dr Nagesh Shukla and Associate Professor Andrea Trianni

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Certificate of Original Authorship

I, *Ananna Paul*, declare that this thesis is submitted in fulfilment of the requirements for the award of Master of Engineering (Research), in the School of Professional Practice and Leadership at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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Signature removed prior to publication.

Ananna Paul

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Dedication

To my family

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Australian food processing sector

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Sustainability challenges

Best-worst method

Multi-criteria decision-making

Abstract

The recent coronavirus disease pandemic, known as the COVID-19 outbreak, has significantly impacted most businesses and their supply chains. Due to the negative impacts of the pandemic, businesses have faced numerous challenges, including sustainability challenges that are critical for any supply chain. Several studies have discussed the impacts of the COVID-19 pandemic on supply chains in the literature; however, there is a significant research gap in analysing supply chain sustainability challenges amid the COVID-19 outbreak. As such, this study aims to contribute to the literature by developing a systematic approach to identifying and analysing pandemic-related supply chain sustainability challenges in the context of the Australian food processing sector. Accordingly, the objectives of this study are to identify supply chain sustainability challenges due to the impacts of the COVID-19 outbreak for the Australian food processing sector, and analyse and prioritise them using a quantitative method.

To achieve these objectives, the study develops a mixed-method approach consisting of both qualitative and quantitative techniques. The qualitative techniques include an online survey to identify, finalise and contextualise the list of sustainability challenges. In this phase, a questionnaire survey is conducted among 10 experts from the Australian food processing sector. The generated data is further analysed using a quantitative technique, namely the best-worst method (BWM), to determine the challenges' priority rankings. Data for the BWM analysis is collected from 12 experts from the Australian food processing sector. Finally, a sensitivity analysis is conducted to judge the robustness of the proposed approach.

From the questionnaire survey, 22 sustainability challenges are finalised and organised into four categories: economic, environmental, social and ethical, and operational challenges. The quantitative results reveal that economic and social and ethical challenges dominate the Australian food processing sector amid the COVID-19 outbreak. The findings also reveal that the top five sustainability challenges faced by the Australian food processing sector due to the pandemic are increased food processing cost, lack of transparency and traceability, increase in the price of raw materials, lack of capital and physical resources and spread of fake information.

This study's findings help decision-makers, practitioners and policymakers in the Australian food processing sector by providing a holistic list of supply chain sustainability challenges due to the impacts of the COVID-19 outbreak. This helps them develop the policies, guidelines and strategies to overcome the most impactful sustainability challenges in the Australian food processing sector to ensure sustainable recovery from the effects of the pandemic.

List of Publications

1. Paul, A., Shukla, N., Paul, S. K., & Trianni, A. (2021). Sustainable supply chain management and multi-criteria decision-making methods: A systematic review. *Sustainability*, 13(13), 7104. <https://doi.org/10.3390/su13137104> (SJR rank: Q1, Impact factor: 3.251)
2. Paul, A., Shukla, N., & Trianni, A. (2022). Modelling supply chain sustainability challenges in food processing sector amid COVID-19 outbreak. *Socio-Economic Planning Sciences*. Under review. (SJR rank: Q1; impact factor: 4.923)

Note: This thesis includes the content from the above papers.

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