


NARRATIVE SYNTHESIS OF THE ECONOMIC IMPACT OF AGRICULTURAL SUPPLY CHAIN AND DISTRIBUTION NETWORKS ON OUTPUT

Swapnil Kagalkar^A, Abhijeet Agashe^B, Tejasvini Alok Paralkar^C, Anant Deogaonkar^D



ARTICLE INFO	ABSTRACT
<p>Article history:</p> <p>Received 03 March 2023</p> <p>Accepted 29 May 2023</p>	<p>Purpose: The objective of this study was to analyze the role of different supply chain players in agri-business and their effect on farmers' output, to arrive at a feasible model of supply network intended for optimizing the surplus in these agri-business supply chains.</p>
<p>Keywords:</p> <p>Agricultural Supply Chains; Distribution Networks; Agricultural Output.</p> <div data-bbox="172 954 480 1200" style="text-align: center;">  </div>	<p>Theoretical framework: A lot of literature is already published on agricultural supply chains and distribution networks but the intention of this study is to understand and explore the economic impact on output.</p> <p>Design/methodology/approach: According to (Denyer and Tranfield, 2009), a systematic review is a procedure that identifies prior research, chooses and assesses contributions, analyses and synthesizes data, and presents the findings in a way that enables reasonably clear conclusions to be drawn about what is known and what is unknown. Accordingly, a five-step approach proposed by them is adopted for this research review, which is illustrated below.</p> <p>Findings: The review of existing literature helped in forming the following categories of researched material, with different contributions to research:</p> <ol style="list-style-type: none"> 1. Technological factors affecting supply chain decisions of agricultural produce 2. Optimization techniques applied to distribution networks 3. Farmers' integration in value-chain and inter-dependencies of players <p>Research, Practical and Social Implications: The study paves way for the identification of an action plan based on the studies on economic impact and also provides future research direction.</p> <p>Originality/Value: No previous work on economic impact analysis of agricultural supply chains is done till now.</p> <p>Doi: https://doi.org/10.26668/businessreview/2023.v8i6.2305</p>

SÍNTESE NARRATIVA DO IMPACTO ECONÔMICO DA CADEIA DE SUPRIMENTOS E DAS REDES DE DISTRIBUIÇÃO AGRÍCOLAS SOBRE A PRODUÇÃO

RESUMO

Objetivo: O objetivo deste estudo foi analisar o papel dos diferentes participantes da cadeia de suprimentos do agronegócio e seu efeito sobre a produção dos agricultores, para chegar a um modelo viável de rede de suprimentos destinado a otimizar o excedente nessas cadeias de suprimentos do agronegócio.

^A Research Scholar. Shri Ramdeobaba College of Engineering and Management. Nagpur, India.

E-mail: mankarvishakha17@gmail.com Orcid: <https://orcid.org/0009-0006-5996-261X>

^B Associate Professor. Department of Management Technology, Shri Ramdeobaba College of Engineering and Management. Nagpur, India. E-mail: agashea@rknc.edu Orcid: <https://orcid.org/0000-0002-9434-5565>

^C Assistant Professor. Department of Management Technology, Shri Ramdeobaba College of Engineering and Management. Nagpur, India. E-mail: paralkarta@gmail.com Orcid: <https://orcid.org/0009-0005-1172-7082>

^D Assistant Professor. Department of Management Technology, Shri Ramdeobaba College of Engineering and Management. Nagpur, India. E-mail: deogaonkara1@rknc.edu Orcid: <https://orcid.org/0000-0003-1999-0027>

Estrutura teórica: Já existe muita literatura publicada sobre cadeias de suprimentos agrícolas e redes de distribuição, mas a intenção deste estudo é entender e explorar o impacto econômico sobre a produção.

Projeto/metodologia/abordagem: De acordo com Denyer e Tranfield (2009), uma revisão sistemática é um procedimento que identifica pesquisas anteriores, escolhe e avalia contribuições, analisa e sintetiza dados e apresenta os resultados de forma a permitir conclusões razoavelmente claras sobre o que é conhecido e o que é desconhecido. Dessa forma, uma abordagem de cinco etapas proposta por eles é adotada para esta revisão de pesquisa, ilustrada a seguir.

Conclusões: A análise da literatura existente ajudou a formar as seguintes categorias de material pesquisado, com diferentes contribuições para a pesquisa:

1. Fatores tecnológicos que afetam as decisões da cadeia de suprimentos de produtos agrícolas
2. Técnicas de otimização aplicadas a redes de distribuição
3. Integração dos agricultores na cadeia de valor e interdependências dos participantes

Implicações sociais, práticas e de pesquisa: O estudo abre caminho para a identificação de um plano de ação com base nos estudos sobre o impacto econômico e também fornece orientações para pesquisas futuras.

Originalidade/valor: Nenhum trabalho anterior sobre a análise do impacto econômico das cadeias de suprimentos agrícolas foi feito até agora.

Palavras-chave: Cadeias de Suprimentos Agrícolas, Redes de Distribuição, Produção Agrícola.

VISIÓN GENERAL DEL IMPACTO ECONÓMICO DE LA CADENA DE SUMINISTRO AGRÍCOLA Y LAS REDES DE DISTRIBUCIÓN EN LA PRODUCCIÓN

RESUMEN

Objetivo: El objetivo de este estudio era analizar el papel de los distintos participantes en la cadena de suministro agroindustrial y su efecto en la producción de los agricultores para llegar a un modelo viable de red de suministro destinado a optimizar el excedente en estas cadenas de suministro agroindustrial.

Marco teórico: Ya existe mucha literatura publicada sobre las cadenas de suministro y las redes de distribución agrícolas, pero la intención de este estudio es comprender y explorar el impacto económico en la producción.

Diseño/metodología/enfoque: Según Denyer y Tranfield (2009), una revisión sistemática es un procedimiento que identifica investigaciones anteriores, selecciona y evalúa las contribuciones, analiza y sintetiza los datos y presenta los resultados de forma que permita extraer conclusiones razonablemente claras sobre lo que se sabe y lo que se desconoce. En consecuencia, para esta revisión de la investigación se adopta un enfoque en cinco pasos propuesto por ellos, que se ilustra a continuación.

Conclusiones: La revisión de la literatura existente ayudó a formar las siguientes categorías de material investigado, con diferentes contribuciones a la investigación:

1. Factores tecnológicos que afectan a las decisiones sobre la cadena de suministro de productos agrícolas.
2. Técnicas de optimización aplicadas a las redes de distribución
3. Integración de los agricultores en la cadena de valor e interdependencias entre las partes interesadas

Repercusiones sociales, prácticas y para la investigación: El estudio allana el camino para la identificación de un plan de acción basado en los estudios de impacto económico y también proporciona directrices para futuras investigaciones.

Originalidad/valor: Hasta la fecha no se ha realizado ningún trabajo previo sobre el análisis del impacto económico de las cadenas de suministro agrícola.

Palabras clave: Cadenas de Suministro Agrícola, Redes de Distribución, Producción Agrícola.

INTRODUCTION

Agri-business supply chains in India consist of many broken links in the production, processing, and marketing stages. A large scope exists in the area of re-designing distribution networks for agri-business supply chains that will meet the changing needs. In this context, Kellengere Shankarnarayan & Ramakrishna, observed that despite agriculture being the foundation of the Indian economy, data indicates a decline in the number of people living in

rural areas and the amount of arable land per person. According to their reports, Indian agriculture contributes 23% of the nation's GDP and possesses the largest output of farms among all nations. They imply that, in order to balance worries about food demand and supply, it is crucial for every farmer in India to equip himself with innovative and cutting-edge instruments and procedures.

The sustainability of agri-businesses is another concern, which is directly or otherwise linked to farmers. According to Naik & Suresh, Businesses and governments are under increasing pressure to focus more on the effects of continuous expansion of agro-based production, distribution, and consumption on the environment and resource use. They also report how to ensure producers, especially small farmers, get involved in sourcing networks, and on the initiatives taken by institutions that assist the farmers in meeting the strict laws that are in force for the safety and quality of food.

The works of Hu, have peripherally addressed the issue of bringing quality framework at the farmer level by inferring that the degree of quality control applied to primary agricultural goods directly influences food quality, which in turn affects demand. Similarly, (Naik & Suresh, 2018) observe, from a sustainability perspective, that the necessary set of enablers – institutions, infrastructure facilities, skilled man-power, laboratory facilities and other support services – is still missing and hence, this limitation is one of the major impediments in the growth of producers in developing countries.

Research Methodology

According to (Denyer and Tranfield, 2009), a systematic review is a procedure that identifies prior research, chooses and assesses contributions, analyses and synthesizes data, and presents the findings in a way that enables reasonably clear conclusions to be drawn about what is known and what is unknown. Accordingly, a five-step approach proposed by them is adopted for this research review, which is illustrated below.

The CIMO (Context, Intervention, Mechanism, Outcome) approach by Denyer et. al (2008) is used to form provoking research questions. The research questions are centered around agri-business supply chains in a multi-player environment including farmers, processing enterprises, logistics service providers, and customers that are inter-connected with financial and technical links (Context), to study the dynamics of supply chain collaboration and dis-intermediation (Intervention) with the help of network optimization, aggregate capacity and

supply management, and pricing-rationalization (Mechanism) to increase the surplus and hence, returns to producers (Outcome). Below are the Research Questions:

What are the strategies, in the field of distribution and inventory management, adopted by agri-businesses to enhance the value of the agricultural output?

To what scale is the surplus of agri-business supply chains affected by the choice of distribution strategies, and whether do extraneous factors like infrastructure and resources (available to farmers) affect such surplus?

The electronic database, Scopus (<https://www.scopus.com/home.uri>) was scanned for publications in agri-business-related journals, and within them, research pertaining to supply chains was shortlisted. Open-access studies available in this database are selected for ease of use. The extent of the supply chain in the agricultural domain has been understood to invite research interests horizontally (crop-science aspects isolated at each stage in the chain) as well as vertically (managerial aspects). Hence, the searches for relevant journals are reflected in both areas. The specific nature of the present topic under study led to an interchangeable use of constructs. The search strings ‘supply chain’ and ‘agri’ were used in combination. Within these search results, keywords like ‘network* optimization’, and ‘pricing’ were scanned.

The extensive number of results on the above terms produced a large set of research papers. However, when an impact filter for the keyword ‘agri-business’ was introduced, the final set of research papers was reduced and resulted in selective quality articles. As a result of this filter, a sample of 21 research articles was identified for further analysis.

Data Analysis and Synthesis

The shortlisted set of articles was conceptually split and then correlated to form meaningful associations and draw valid inferences regarding the subject under study. The articles were studied repeatedly through an iterative evaluation process, and compared with each other on the following points:

- a. Modern levers controlling supply chain performance
- b. Levels of control maintained by intermediaries in determining the network design of supply chain in agri-businesses
- c. Recommendations of supply chain models viable for adaptation to agri-businesses with the inclusion of benefits to upstream players
- d. Pricing mark-ups at each level, and market-related dynamics affecting prices.

RESULTS AND DISCUSSION

Descriptive Analysis

The review of existing literature helped in forming the following categories of researched material, with different contributions to research:

4. Technological factors affecting supply chain decisions of agricultural produce
5. Optimization techniques applied on distribution networks
6. Farmers' integration in value-chain and inter-dependencies of players

Such categorization further revealed how supply chain management in agri-business has been approached by practitioners over time. The relevant literature, from the years 2016 to 2022 illustrates the focus of research shifting from an industry-centric approach to player-centric sustainable value-chains. The keyword 'Optimization' alone is used in four of the reviewed papers suggestive of models for finding the best supply chain fits. The term 'Robust Optimization' and its variant 'Robust Temporal Optimization' were found to be used in two of the reviewed papers while the prefix 'multi-' has been used in the case of the period (multi-period model), and criteria and commodity (multi-criteria multi-commodity model) in each corresponding research paper. The terms 'agri-food', 'agri-retail', and 'agri-business' were found to denote a framework for agricultural supply chains in either way.

Thematic Analysis - Supply Chain Practices and Key Issues

In the context of modern trends in managing supply chains in a competitive framework, (Borade & Bansod, 2007) infer that organizations use a variety of defensive and offensive business performance improvement techniques to try to achieve the goals of higher competitiveness, better customer service, and see increased profitability. Often only a single operational area of the organization is targeted. Further, new-age trends like business process outsourcing, adoption of methods invented in the field of information technology, and third-party logistics hold tremendous potential for the development and management of the supply chain.

Increasing global competition necessitates enhanced supply chain capabilities. (Hove-Sibanda & Pooe, 2018) state that, there is not a single instance where the supply chain practices within the firm have been linked with the interfirm practices of strategic information sharing, e-collaboration, and supply chain competency as its antecedents. Managers, practitioners, and researchers alike are looking for ways to better understand how supply chains perform, given the established link between corporate performance and that of the supply chain. In a similar

study done by (Monnagaaratwe & Motatsa, 2021) regarding supply chain management initiatives for food produce retailers of moderate scales in South Africa, the authors state that one, supply chain management enhances business competitiveness through competitive advantage, dealing with competitors, and customer service and competitiveness, and two, supply chain collaboration enhances it by the development of a sound relationship with suppliers.

Delivery-wise, downstream information in SC like demand gets amplified as it moves upstream in any typical chain due to supply chain noise and managerial interventions. This phenomenon is more observed at the receiving end of omnichannel chains, for which (Weber & Badenhorst-Weiss, 2018), who conducted a study in South Africa, list the following findings. One of the potential barriers faced by online grocery retailers in South Africa is last-mile logistical challenges. Reliable order fulfillment, reverse logistics, cold storage, distribution chain requirements, and physical distribution are the four distinct codes that constitute these challenges. In the regard of SC sustainability, (Niehaus et al., 2018) through their study on selected organizations, conclude that a large number of the reports on sustainability and the integrated annual reports, which were studied by them, included the keywords related to supply-chain. A minimum of 68% of the total number of companies, which was 155, comprised 'inventory', 'procurement', 'supply chain', and 'logistics'.

Thematic Analysis - Operational Challenges in Indian Agri-business Supply Chains

The Indian agri-business sector is vulnerable to myriad challenges borne out of constraints like aggressive operational infrastructure, lack of resources, etc. (Connolly et al., 2016) infer from their interviews on subjects that constraints on production factors, which are easily accessible elsewhere in the economy or in the world, are the cause of regionally low productivity. (Surbhi S, et.al,2023) The above authors' further state in their article that, food loss is a characteristic more attributed to less developed nations, while food waste is that in higher order economies. While referring to the GLIMPSE framework (**G**overnment & policies, **L**osses, **I**nfrastructure & investments, **M**arkets: consumers, **P**eople, **S**cience & Innovation, **E**nvironment), it is observed that production and logistics process are the main areas where food loss occurs, in the case of developing countries. On the other hand, developed regions have shown food waste a generic problem at the retail and consumer level.

(Ali, 2016), in its paper highlighting the role of small and medium-sized food and agri-business enterprises (SMEs) in India. By investigation and hypothesis-testing based on regions,

size of locality, firms' characteristics, etc. the author infers that in India, in comparison to major companies, which operate in the northern and eastern regions, agri-business SMEs are majorly located in larger cities and so, belong to the southern region. (Naik & Suresh, 2018) have pointed toward the perishability of agri-produce as a growing concern among others. The products' perishable nature imposes a variety of restrictions on how well poor demand and supply information can be handled. In order to develop traceability, which can improve quality verification and minimize expenses in the event of food safety issues, cooperation among supply chain participants is required. Visibility, decision-making, and control of supply chains can be enhanced as well as administrative costs can be reduced by implementing information technology tools like chain-wide reporting.

Price determination is also a concern in agricultural produce. According to a study conducted by (Watabaji et al., 2016) for Value Chain Integration (VCI), the only external factors that show a substantial positive link with success at farmers' cooperatives are collaboration and collaborative decision-making. The authors expressed the need to include VCI dimensions – collaboration, commitment, coordination, and joint decision-making, which were assumed to be positively associated with Value Chain Performance (VCP). In the same context, (Naik & Suresh, 2018) posit that farm production is, in essence, a “push” system, and many times, there is a gap between supply and demand. Times of surplus are characterized by farmers receiving lower prices, whereas times of shortage exhibit a loss of assurance in quality for retailers since they are required to buy in the spot market.

Thematic Analysis - Approaches to Network Optimization and Proposed Models

(Kambli & McGarvey, 2021) postulate model formulation by first selecting a group of utilized hubs from total candidate locations followed by assignment of farms to each hub, so that the objective of minimization of total ton-miles travelled in a year can be met. However, this framework excludes considerations of vehicle payloads and food losses during transit. The authors have proposed Mixed Integer Linear Programming (MILP) as an optimization model, which allows variability in agricultural produce. Further, Robust Optimization (RO) models create solutions that are feasible for every realization of uncertainty in a given set, which is a better case than using probabilistic information which defends the solution from uncertainty. The proposed model considered that, according to the user's level of robustness which is pre-specified, it reduces the overall ton-miles travelled across a time horizon that is applicable for multiple periods.

In a related quality framework, the works of (Hu et al., 2019) propose to apply the Stackelberg game theory to analyze decision-making in a system of a four-level agricultural supply chain which consists of a single agricultural producer, a single processing enterprise, one distributor, and multiple consumers. The first move is made by the agricultural producer who, according to profit, chooses the quality control level for primary agricultural products. The next move is made by the processing enterprise, who, in order to optimize its own profit, chooses a process quality level and food wholesale price. Then, the processing company and distributor execute contracts for profit-sharing and quality commitments with customers. Finally, the processing company and distributor decide the wholesale and retail (market) pricing of the food respectively. The quantity of food to be consumed is determined by consumers through factors like market price, level of quality, and commitment to quality.

Other studies have elaborated applications of network optimization models in agricultural as well as non-agricultural frameworks, viz. multi-criteria multi-commodity flow model to maximize total weighted flow and minimize the cost of travel (Bevrani et al., 2020), robust temporal optimization for product planning (Randall et al., 2022), and joint optimization using mobile supply chains (Shahmoradi-Moghadam & Schönberger, 2021).

Thematic Analysis - A Framework to Facilitate Integration of Small Producers with Big Processors

The literature review further led to the discovery of the application of conceptual frameworks like Rural Web that analyses and evaluates the socio-economic complexity of target value chains in agricultural commodities (Arato et al., 2017). It proposes catapulting the traditional rural web consisting of simple economic linkages and product flow with multi-dimensional linkages (six) at each node. (Nihal, G.et.al,2023). The dimensions are social capital, sustainability, endogeneity, novelty production, new institutional arrangements, and market governance. The evaluation of the rural producers' region-specific traits was made possible by the Rural Web analysis.

Thematic Analysis - Case of Adaptations in African Markets

From a qualitative and participants-based study done in emerging African markets, (Jaqueta et al., 2020) observed the following physical distribution challenges and corresponding adaptations. The dominant transportation challenges that the participants identified comprised theft of vehicles, weak infrastructure, and cost fluctuation. In rising African markets, poor road

conditions have been identified as the main infrastructure concern. The problems like management of service standards, cost levels, and adherence to standards of distributor facilities are only some of the operational challenges that arise out of the partnership with a distributor. Warehouse Management Systems (WMS) was implemented by participants in various markets to make the activities uniform, as well as check that processes and stock are visible throughout the various markets to correct the difficulties of manual and misaligned systems. The authors further emphasize that the context of order processing assumes significance due to the complex system and intervention of distributors and local retailers. The participants' top alarming issues in order processing were the non-automated processing of orders and the acute shortage of assistance for systems used in managing these markets.

Model Formulation

The study helped in arriving at a network model for Indian agri-business supply chains, that are largely affected by upstream topography, the density of enterprises, and erratic demand-supply volumes which necessitate probabilistic optimization techniques. The purpose was to achieve rationalization by identifying the number of potential locations (n) for processing enterprises to set up their units, and the number of distributors (markets or demand points - m) and optimizing the network using Capacitated Plant Location Model (Chopra, S. et al., 2010, pp. 135-136) which uses the formula:

Objective Function:

$$\text{Min } \sum_{(i=1 \text{ to } n)} f_i y_i + \sum_{(i=1 \text{ to } n)} \sum_{(j=1 \text{ to } m)} c_{ij} x_{ij}$$

Subject to:

$$\begin{aligned} \sum_{(i=1 \text{ to } n)} x_{ij} &= D_j && \text{for } j = 1, \dots, m \\ \sum_{(j=1 \text{ to } m)} x_{ij} &\leq K_i y_i && \text{for } i = 1, \dots, n \\ y_i &\in \{0,1\} && \text{for } i = 1, \dots, n, x_{ij} \geq 0 \end{aligned}$$

Where,

D_j = annual demand from distributor (market) j

K_i = potential capacity of processing enterprise i

f_i = annualized fixed cost of keeping processing enterprise i open

c_{ij} = cost of processing and shipping one unit from processing enterprise i to a distributor (market) j

y_i = 1 if processing enterprise i is open, or 0 otherwise

x_{ij} = quantity shipped from processing enterprise i to a distributor (market) j

The articles considered for this review were selected to draw impactful observations that will enable transformative supply chains. From a holistic perspective, it follows that the multi-objective, multi-period, and robust optimization models studied above may be applied for reducing uncertainty and addressing topographical constraints faced by agri-business supply chains. The proposal of this study is not just an enhanced agri-business supply chain but an integrated agri-based supply chain ecosystem, comprising of the following elements:

1. Regional Facility Configuration of Processing Enterprises
2. Logistics Deployment connecting Farms to Facilities
3. Collaborative Planning
4. Chain-wide Reporting

The first element, regional facility configuration is intended to address the skewed network of processing enterprises (agri-business SMEs that are reportedly concentrated more in the southern parts). This is proposed in above model.

Feed-Forward to Pricing & Transportation

The demand and supply points identified in the above model can act as a feed-forward mechanism for farmers to decide who should be their target processing enterprises. The Stackelberg Game Model may then be activated after such a move is made by the farmer, thus passing over some pricing-control upstream. The same model may affect the choice of transportation, depending on the proximity between two nodes and the quantity shipped during each run, full truckload or less than truckload. A direct shipping option may be utilized over a multi-period time horizon as compared to one with a distribution center and milk runs, both of which have implications of holding the inventory and additional coordination required.

CONCLUSION

The objective of this study was to analyze the role of different supply chain players in agri-business and their effect on farmers' output, to arrive at a feasible model of supply network intended for optimizing the surplus in these agri-business supply chains. From the literature review and thematic analysis, adjustments to supply chain challenges in countries like South Africa come as a notable feature. These adaptations were brought through centralized interventions, the development of contingency plans, and changes in distribution networks. In the Indian context, the demographics of small and medium food and agri-business differ as compared to large companies in terms of concentration, remuneration, and operational

challenges. (Hove-Sibanda & Pooe, 2018), through their reliability tests and structured equation modelling, show that the nature of business is the determinant of the chain's e-collaboration, practices, strategic information sharing, performance, and competence. Multi-echelon models have shown that action plans for profit-sharing and commitment towards quality address the quality issues upstream (producers). While quality control was observed to stimulate consumer demand (cause), it was seen as a consequence of variation in agricultural producer responsibility and processing enterprise commitment.

REFERENCES

- Ali, J. (2016). Performance of small and medium-sized food and agribusiness enterprises: Evidence from Indian firms. *International Food and Agribusiness Management Review*, 19(4), 53–64. <https://doi.org/10.22434/IFAMR2016.0024>
- Arato, M., Speelman, S., Dessen, J., & van Huylenbroeck, G. (2017). Assessment of socio-economic configuration of value chains: A proposed analysis framework to facilitate the integration of small rural producers with global agribusiness. *International Food and Agribusiness Management Review*, 20(1), 25–43. <https://doi.org/10.22434/IFAMR2015.0060>
- Bevrani, B., Burdett, R., Bhaskar, A., & Yarlagadda, P. K. D. V. (2020). A multi-criteria multi-commodity flow model for analyzing transportation networks. *Operations Research Perspectives*, 7. <https://doi.org/10.1016/j.orp.2020.100159>
- Borade, A. B., & Bansod, S. v. (2007). "DOMAIN OF SUPPLY CHAIN MANAGEMENT-A STATE OF ART." In *J. Technol. Manag. Innov* (Vol. 2, Issue 4). <http://www.jotmi.org>
- Chopra, S., Meindl, P., & Kalra, D. V. (2010). *Supply Chain Management: Strategy, Planning and Operation* (4th Ed.), Dorling Kindersley (India) Pvt. Ltd.
- Connolly, A. J., Sodreb, L. R., & Phillips-Connolly, K. (2016). GLIMPSE 2.0: A framework to feed the world. *International Food and Agribusiness Management Review*, 19(4), 1–22. <https://doi.org/10.22434/IFAMR2015.0202>
- Hove-Sibanda, P., & Pooe, R. I. D. (2018). Enhancing supply chain performance through supply chain practices. *Journal of Transport and Supply Chain Management*, 12. <https://doi.org/10.4102/jtscm.v12i0.400>
- Hu, J. you, Zhang, J., Mei, M., Yang, W. min, & Shen, Q. (2019). Quality control of a four-echelon agri-food supply chain with multiple strategies. *Information Processing in Agriculture*, 6(4), 425–437. <https://doi.org/10.1016/j.inpa.2019.05.002>
- Jaqueta, S. D. J., Mashilo, E. N., Mocke, K., & Agigi, A. F. A. (2020). Physical distribution challenges and adaptations: A qualitative study of South Africa-based organisations operating in emerging African markets. *Journal of Transport and Supply Chain Management*, 14. <https://doi.org/10.4102/jtscm.v14i0.475>

Kambli, A., & McGarvey, R. G. (2021). Network design for local agriculture using robust optimization. *Information Processing in Agriculture*, 8(3), 469–483. <https://doi.org/10.1016/j.inpa.2020.09.004>

Kellengere Shankarnarayan, V., & Ramakrishna, H. (2020). Paradigm change in Indian agricultural practices using Big Data: Challenges and opportunities from field to plate. In *Information Processing in Agriculture* (Vol. 7, Issue 3, pp. 355–368). China Agricultural University. <https://doi.org/10.1016/j.inpa.2020.01.001>

Monnagaaratwe, K. F., & Motatsa, K. W. (2021). Enhancing business competitiveness of medium-sized food produce retailers through supply chain management. *Journal of Transport and Supply Chain Management*, 15. <https://doi.org/10.4102/jtscm.v15i0.639>

Naik, G., & Suresh, D. N. (2018). Challenges of creating sustainable agri-retail supply chains. *IIMB Management Review*, 30(3), 270–282. <https://doi.org/10.1016/j.iimb.2018.04.001>

Niehaus, G., Freiboth, H. W., & Goedhals-Gerber, L. L. (2018). Corrigendum: Investigating supply chain sustainability in South African organisations. In *Journal of Transport and Supply Chain Management* (Vol. 12). AOSIS (pty) Ltd. <https://doi.org/10.4102/jtscm.v12i0.437>

Randall, M., Montgomery, J., & Lewis, A. (2022). Robust temporal optimisation for a crop planning problem under climate change uncertainty. *Operations Research Perspectives*, 9. <https://doi.org/10.1016/j.orp.2021.100219>

Shahmoradi-Moghadam, H., & Schönberger, J. (2021). Joint optimization of production and routing master planning in mobile supply chains. *Operations Research Perspectives*, 8. <https://doi.org/10.1016/j.orp.2021.100187>

Watabaji, M. D., Molnar, A., Dora, M. K., & Gellynck, X. (2016). The influence of value chain integration on performance: An empirical study of the malt barley value chain in ethiopia. *International Food and Agribusiness Management Review*, 19(4), 79–94. <https://doi.org/10.22434/IFAMR2015.0201>

Weber, A. N., & Badenhorst-Weiss, J. A. (2018). The last-mile logistical challenges of an omnichannel grocery retailer: A South African perspective. *Journal of Transport and Supply Chain Management*, 12. <https://doi.org/10.4102/jtscm.v12i0.398>

Nihal, G., Mounia, C., Hussain, M., Humayun, S., Perveen, N., Yousaf, N. R., & Akhtar, S. (2023). Impact of Innovation on Economic Growth of G8 Countries- Analysis Over 1996-2020. *International Journal of Professional Business Review*, 8(5), e01413. <https://doi.org/10.26668/businessreview/2023.v8i5.1403>

Saxena, S., Deogaonkar, A., Pais, R., & Pais, R. (2023). Workplace Productivity Through Employee Sentiment Analysis Using Machine Learning. *International Journal of Professional Business Review*, 8(4), e01216. <https://doi.org/10.26668/businessreview/2023.v8i4.1216>