Sustainable Performance Assessment towards Sustainable Consumption and Production

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The sustainable supply chain management (SSCM) literature has grown alongside the dominant discourse that economic, environmental, and social sustainability can be simultaneously achieved through practices that legitimize a win–win business case, with a focus on the potential contributions to the triple bottom line.

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1. Introduction

The sustainable supply chain management (SSCM) literature has grown alongside the dominant discourse that economic, environmental, and social sustainability can be simultaneously achieved through practices that legitimize a win–win business case, with a focus on the potential contributions to the triple bottom line [1][2]. Sustainability agendas based on the win–win business case, according to Gaya and Phillips [3], only succeed because they adhere to the mainstream language of increasing profits rather than questioning the current paradigm [4]. For obvious reasons, the dairy supply chain has a significant global impact on CO_2 emissions due to the necessity of the regular refrigeration of perishable dairy products [5]. The United Nations Sustainable Development Goals (SDGs) have ushered in a new era of global development, aiming to address urgent global challenges related to the environment, society, and economy. In response to these challenges, many industrial corporations have acknowledged the significance of the SDGs and are actively reporting on various topics aligned with these goals. These topics include water management, health and safety, working conditions, and climate change. These corporations recognize the importance of aligning their practices with the SDGs to contribute to a sustainable future. As a result, through incorporating a comprehensive triple bottom line (TBL) approach, sustainable performance assessment has become essential for tracking progress toward sustainable development. Unlike traditional performance assessment, which primarily focuses on economic aspects, sustainable performance assessment integrates all dimensions of the TBL (environmental, social, and economic) within a single framework. This broader perspective enables firms to assess their progress across environmental, social, and economic aspects.

Producing food often involves a network of interconnected SCs and includes several processes [6]. Decisions and management systems that impact sustainability performance are developed and implemented by SC members, particularly in the operations and marketing departments [7][8]. The manufacturing capacities of most SC members must meet sustainability credentials, which have a significant impact on green marketing [9]. Today, the management of stakeholders effectively necessitates integrating customers' concerns about environmental and

social responsibility with other dimensions of value [10][11]. Stakeholder interactions (such as supplier partnerships), logistics, and customer relationships can amplify or attenuate sustainability performance and production-related hazards, whereas process design and technology often determine the waste created and resources and energy used [10]. The monitoring of sustainable development progress is important, and it depends on many criteria and subcriteria. Hence, one important question arises, i.e., *"what are the critical Indicators which is used in measure the sustainable performance of dairy industry?"* Although many references in the literature have determined the critical criteria and subcriteria for performance assessment, very little work has been conducted regarding the Indian context of dairy firms that are working towards the achievement of SCP.

2. Sustainability in Dairy Supply Chain

According to Carter and Rogers [12], when environmental and social aspects of sustainability that extend beyond a firm's boundary are combined with economic objectives in a deliberate long-term strategy along with the inclusion of SC activities in firm sustainability, it can create a pervasive and less imitable set of processes as well as potential bases for competitive advantage for them and associated chain members. Carter and Rogers [12] define sustainability as a strategic transparent integration of an organization's social, environmental, and economic goals along with key inter-organizational business processes for improving the individual company's and its supply chains' long-term economic performance.

The dairy industry is a major contributor to global warming because of the massive amounts of greenhouse gases (GHGs) it emits [13]. The dairy industry's greenhouse gas emissions climbed by 18% from 2005 levels to 2015 levels, which is a deep concern for the global environment [14]. The production of these relies heavily on the use of fossil fuels at every stage of the process, which comes mostly from the enteric fermentation of bovine stomach contents [15]. On the other hand, the dairy industry generates 70–80% of the total rural economy as well as 45–55% of employment. Human diets rely heavily on dairy products because they provide a substantial amount of protein and several critical minerals and vitamins, including calcium and vitamin B12 [16]. Dairy products (including cheese, milk, and butter) contribute roughly 14% to overall consumption in affluent nations and about 5% in underdeveloped countries in terms of dietary calorie intake [17]. A considerable increase in demand for dairy products raises questions about the sector's long-term viability considering the rapidly expanding global population, rising per capita income, and "Westernizing" food patterns in the East [18]. In fact, between 2020 and 2030, the market for fresh dairy products is predicted to grow at a compound annual rate of 1.0%. [18]. Despite their nutritional significance, dairy products are produced with a substantially larger carbon footprint than their plant-based counterparts [19]. Low-meat, vegetarian, and vegan diets are on the rise as a result of consumers' increased concern for environmental impact and animal welfare [20]. In fact, compared to meat eaters, vegans produce around half as many greenhouse gas emissions from their food choices [21]. Therefore, adopting a plant-based diet might significantly aid in the preservation of the natural world. However, with a large number of advantages and disadvantages in the environmental aspects, balance between people, planet, and profit, is required, and hence, sustainable development in the dairy industry is necessary. Towards the development of sustainability, regular performance monitoring is one of the major tasks. Regular sustainability assessment is required for the continuous

improvement of sustainable development in the dairy industry. From farmers to markets, there are multiple steps in the dairy supply chain, and at each stage, there are different risk factors that might have an impact on sustainability, as shown below in **Table 1**.

Table 1. Identified Risks factors at each step of the dairy supply chain for sustainability.

Stage	Risk Factor	Description
Farmer	Land Degradation	Farmland can become less sustainable over the long term due to soil erosion, deforestation, and excessive pesticide usage.
	Climate Change	Climate change: The production and quality of milk can be impacted by more unpredictable weather patterns, such as droughts or floods.
	Animal Health	Infections and diseases that affect dairy animals might spread, resulting in lower productivity and more frequent usage of antibiotics.
Milk Collection and Processing:	Energy Use	Poor methods for gathering and processing milk can result in higher energy use and greenhouse gas emissions.
	Water Usage	During the production of milk, inefficient water management and excessive water use can put pressure on the local water supply.
	Food Safety	Mishandling or contamination of milk during collection and processing can endanger consumer health and tarnish the dairy industry's reputation.
Packaging and Transportation:	Packaging Waste	Packaging waste, such as plastic containers improperly disposed of, can cause environmental damage.
	Carbon Footprint	Excessive long-distance shipping and ineffective transportation operations can raise greenhouse gas emissions and carbon footprint.
	Supply Chain Transparency	It may be challenging to maintain ethical and sustainable practices throughout the supply chain in the absence of traceability and monitoring tools.
Consumer and Retail:	Food Waste:	Dairy products that are improperly handled, stored, or that have expired can produce a lot of food waste.
	Consumer Awareness	Consumer demand for sustainable goods may be impacted by consumers' ignorance or indifference to sustainable dairy producing processes.
	Pricing Pressure	Market dynamics and price pressures may force businesses to slash costs in ways that undermine sustainability initiatives.

3. Sustainable Performance Assessment in Dairy Supply Chain

Most definitions of SPA focus on it being a decision-making aid that prioritizes long-term sustainability. Several studies have applied the TBL concept of sustainability to the food industry to investigate sustainable performance [22][23][24]. However, many studies evaluating the food industry's efficacy simply look at sustainability with an environmental focus [13][25]. Using a combined Slacks-based measure (SBM) and data envelopment analysis (DEA) technique, Cecchini et al. [26] assessed the environmental performance of dairy companies. Life cycle assessment (LCA) methods have been used to evaluate the environmental impact of the dairy industry [13][25][27]. The performance impact of the multi-tier supply chain is measured, and a theoretical framework for societal SD was developed by Mohammed et al. [28]. Using a combination of TISM and ANP, Chen et al. [29] created a socially responsible supplier assessment methodology. The analytical methodology and FSC performance metrics were created by Moazzam et al. [30] based on efficiency, flexibility, responsiveness, and quality. Using the notion of the circular economy, Kazancoglu et al. [31] designed a method for evaluating the effectiveness of FSC's reverse logistics. By bringing together the circular economy, Industry 4.0, and cleaner manufacturing, Gupta et al. [32] designed a hybrid ethical and sustainable business performance paradigm. Barriers to sustainable company operations were examined by Kumar et al. [33] from the viewpoints of Industry 4.0 and the circular economy. With a fuzzy decision-making trial and evaluation laboratory (DEMATEL) based on ANP and TOPSIS approaches, Sufiyan et al. [34] assessed long-term FSC performance. Environmental degradation, social welfare, and economic insecurity were all areas where Bloemhof et al. [35] found that TBL might be utilized in FSC. To reduce carbon dioxide emissions, overall SC costs, and gridlock while still meeting the SDG, the SSC network was built [36].

4. Sustainability KPIs

Given the evolving context and the dynamic nature of environmental, social, and economic aspects, the adoption of new sustainable Key Performance Indicators (KPIs) becomes imperative. These KPIs need to be carefully selected to ensure that they provide a comprehensive assessment of an organization's performance, encompassing the entire value chain, considering industry-specific context, engaging stakeholders, and aligning with strategic objectives. Choosing the appropriate KPIs is of utmost importance for organizations [32]. Researchers in the field of sustainability assessment have used only TBL dimensions in the past Kumar et al. [22], but Gupta et al. [32] have combined the TBL with Industry 4.0, the circular economy, and clean technology to improve manufacturing organization performance. The six-dimensional approach used by Chen et al. [29] provided that, to choose a socially responsible food provider, one must consider price, longevity, quality, service, communication, and collaboration. Using an integrated, sustainable, and adaptable supply chain as their starting point, Negri et al. [37] created a conceptual framework. Lean, agile, resilient, and sustainable supply chains are the focus of a conceptual framework established by Sharma et al. [38]. When evaluating the effectiveness of a reverse supply chain, Dev et al. [39] use a circular economy approach.

Focusing on social costs influenced by activities like investment in the collection and the size of the end-user market that determines profits is important since they are based on a trade-off analysis between economic and

environmental performance and the functioning of I4.0 and circular economy [39]. Past environmental KPIs used by researchers [40] include greenhouse gas emissions, use of water and electricity, green logistics, and more. As a result, economic performance indicators include profit, food quality, logistical efficiency, revenue growth, R&D spending, etc. [35][41]. Profit sharing, employee well-being, human resources, supply chain (SC) transparency, gender equity, etc., were all used as social KPIs by researchers [42]. Key performance indicators (KPIs) for CEP in the SSC include waste management, recovery, recycling, and the efficacy of reverse logistics [43] (**Table 2**).

Table 2. Performance indicators with description and source.

Performance Indicators PIs	Description	Source
Effective business and operations (EBO)	Business effectiveness and operations play a significant role in achieving a balance among the sustainable triple bottom-line approach. Optimal business operations help the environment, society, and economy.	[44]
Use of Quality standards and HACCP (UQS)	The use of high-quality standards and HACCP standards in the food system helps to lower food wastage along with high satisfaction to the consumer.	[22]
Green supplier (GSR)	The selection of green suppliers is a crucial step in reaching the objective of sustainable development since it helps to minimize emissions from the very beginning of the supply chain.	[45]
Cold chain effectiveness (CCE)	The efficacy of the cold chain plays a vital role in the supply chain for dairy products since it gives the product longer shelf life, ensures optimum emissions from refrigerated vehicles, and reduces waste of transportation.	[22]
Responsiveness to customer demand (RCD)	Responsiveness to customer demand helps to create long-lasting relationships with customers, timely delivery of a product, and an increase in demand.	[45]
Use of Technology (UOT)	The dairy industry has recently realized the importance of applying technology to automate production, maintain hygienic standards, fulfil orders from customers, deliver products on time, and monitor emissions in real time.	[22] [45]
Waste management (WMT)	Waste management metrics measure how well SC's waste management practices dispose of hazardous and chemical waste for SCP, aiding in the achievement of SDG 12.4.	[22]
Research and development (RND)	Nowadays, sustainable growth is absolutely necessary inside the company to produce an eco-friendly product to maintain our ecosystem by reducing environmental effects and harmful food ingredients, so research and development will play a significant role.	[22] [45]
Average supply chain cost (ASC)	Total supply chain costs are the leading indicator of any supply chain performance. Various costs are associated with the supply chain cost, such as procurement cost, holding cost, shortage cost, and transportation cost. Need to use sustainable procurement and transportation network.	[46]

Performance Indicators PIs	Description	Source
Capacity utilization rate (CUR)	Proper use of the company's warehouse, shop floor, delivery vans, and other facilities within the firm is important.	[46]
Traceability (TRA)	Traceability is a cutting-edge technology that is often used for monitoring and tracking to improve product security and safety. It allows the consumer to track their order details and delivery of the product.	[45]
GHG emission (GHG)	By calculating equivalent carbon emissions, greenhouse gas emissions are the key indicator for monitoring and mitigating environmental damage.	[22]
Gender equity (GEQ)	Gender equity in the business organization is recommended to take advantage of experience from a diverse set of people. With gender equity, a firm's social performance is improved.	[45]
Employment generation (EGR)	Employment generation is an important social measurement that is used to assess a firm's social performance based on its ability to generate employment.	[22]
Utilization of modern environment management system (MEM)	Another strategy for tracking and managing the environmental impact/emissions generated by the firm is to use a modern environment management system. The MEM system enables real-time monitoring of the firm's environmental emissions, which can then be readily managed and used to develop reduction strategies to improve environmental performance.	[46]
Utilization of green and recycled material (GER)	The use of green and recyclable materials in the dairy industry, particularly packaging materials, helps to reduce waste and GHG emissions, hence improving environmental performance.	[46]
Share of renewable energy (SRE)	The utilization of renewable energy in the dairy firm is important to lower GHG emissions.	[22]
Profit sharing (PSH)	Profit sharing among farmers and suppliers is a key factor in improving the social performance of the dairy business. Because the dairy sector is so reliant on farmers and vice versa, maximal profit sharing is critical to improving social performance.	[22]
Revenue growth (REG)	Continuous revenue expansion is also an important component of dairy enterprises in order to increase economic performance.	[22]

Sustainability assessment tools may be positioned along three dimensions of the categorization framework established by Morrison-Saunders et al. [47]: (1) underlying sustainability discourses, (2) representations of sustainability within the assessment process, and (3) the decision-making environment. Information creation for decision making, complexity structuring, operationalization, a venue for participation, discussion, and deliberation, and social learning are all goals of SA, as stated by [48]. A further goal of SA, as stated by Moldavska and Welo [49], is "to help decision-makers, simplifying the identification of measures that they should do in the endeavor to contribute to sustainable development." They added that SA was to alert them of problems that needed fixing within the organization. A review of the relevant literature revealed that researchers have previously employed a wide range of qualitative and quantitative methods to evaluate various outcomes. For environmental sustainability assessment in FSC, several studies have used LCA [13]. While several studies have used data envelopment

analysis (DEA) methods to evaluate sustainability [26], others have turned to balanced scorecards [42]. The sustainability assessment of FSC has been conducted using various MCDM methods [50]. Fuzzy TOPSIS was used by Govindan et al. (2013) [45] to rate vendors on their contribution to environmental sustainability. Green SC performance is quantified by Uygun and Dede [51] using a DEMATEL-ANP-TOPSIS hybrid model of the MCDM. The SCOR model may be connected to supply chain performance indicators such as dependability, responsiveness, flexibility, cost, asset metrics, and sustainability [52]. SCOR is a methodology for measuring the environmental effect of an organization's supply chain activities in terms of its capacity for sustainability and natural resource management [52]. Because the SRPM framework's practical applicability is dependent on a resource-based perspective, the SCOR model is used to clearly align the business processes and activities (i.e., plan, source, make, deliver, and return) as firm resources are important in identifying the scope for socio-economic and socio-environmental sustainability.

References

1. Matthews, L.; Power, D.; Touboulic, A.; Marques, L. Building Bridges: Toward Alternative Theory of Sustainable Supply Chain Management. J. Supply Chain Manag. 2016, 52, 82–94.
2. Pagell, M.; Shevchenko, A. Why Research in Sustainable Supply Chain Management Should Have No Future. J. Supply Chain Manag. 2014, 50, 44–55.
3. Gayá, P.; Phillips, M. Imagining a Sustainable Future: Eschatology, Bateson's Ecology of Mind and Arts-Based Practice. Organization 2016, 23, 803–824.
4. Prasad, P.; Elmes, M. In the Name of the Practical: Unearthing the Hegemony of Pragmatics in the Discourse of Environmental Management. J. Manag. Stud. 2005, 42, 845–867.
5. Cannas, V.G.; Ciccullo, F.; Pero, M.; Cigolini, R. Sustainable Innovation in the Dairy Supply Chain: Enabling Factors for Intermodal Transportation. Int. J. Prod. Res. 2020, 58, 7314–7333.
6. Gerbens-Leenes, P.W.; Moll, H.C.; Schoot Uiterkamp, A.J.M. Design and Development of a Measuring Method for Environmental Sustainability in Food Production Systems. Ecol. Econ. 2003, 46, 231–248.
7. De Burgos Jiménez, J.; Céspedes, J.J. Environmental Performance as an Operations Objective. Int. J. Oper. Prod. Manag. 2001, 21, 1553–1572.
8. Ilbahar, E.; Kahraman, C.; Cebi, S. Evaluation of Sustainable Energy Planning Scenarios with a New Approach Based on FCM, WASPAS and Impact Effort Matrix. Environ. Dev. Sustain. 2022.
9. Sarkis, J. Manufacturing's Role in Corporate Environmental Sustainability Concerns for the New Millennium. Int. J. Oper. Prod. Manag. 2001, 21, 666–686.

10. Angell, L.C.; Klassen, R.D. Integrating Environmental Issues into the Mainstream: An Agenda for Research in Operations Management. J. Oper. Manag. 1999, 17, 575–598.
11. Tasdemir, C.; Gazo, R.; Quesada, H.J. Sustainability Benchmarking Tool (SBT): Theoretical and Conceptual Model Proposition of a Composite Framework. Environ. Dev. Sustain. 2020, 22, 6755–6797.
12. Carter, C.R.; Rogers, D.S. A Framework of Sustainable Supply Chain Management: Moving toward New Theory. Int. J. Phys. Distrib. Logist. Manag. 2008, 38, 360–387.
13. Kumar, M.; Kumar Choubey, V.; Deepak, A.; Gedam, V.V.; Raut, R.D. Life Cycle Assessment (LCA) of Dairy Industry: A Case Study of North India. J. Clean. Prod. 2021, 326, 129331.
14. Aziz, E. The Impact of COVID-19 on Food and Agriculture in Asia and the Pacific and FAO's Response. In Proceedings of the 35th Session of the Regional Conference for Asia and the Pacific, Virtual, 1–4 September 2020; pp. 1–16.
15. Ladha-Sabur, A.; Bakalis, S.; Fryer, P.J.; Lopez-Quiroga, E. Mapping Energy Consumption in Food Manufacturing. Trends Food Sci. Technol. 2019, 86, 270–280.
16. Soetan, K.O.; Olaiya, C.O.; Oyewole, O.E. The Importance of Mineral Elements for Humans, Domestic Animals and Plants: A Review. African J. Food Sci. 2010, 4, 200–222.
17. Gerosa, S.; Skoet, J. Milk Availability: Trends in Production and Demand and Medium-Term Outlook; Food and Agriculture Organization of the United Nations (FAO): Rome, Italy, 2012.
18. OECD/FAO. Chapter 7. Dairy and Dairy Products. In OECD-FAO Agricultural Outlook 2018–2027; Food and Agriculture Organization of the United Nations (FAO): Rome, Italy, 2018.
19. Lacour, C.; Seconda, L.; Allès, B.; Hercberg, S.; Langevin, B.; Pointereau, P.; Lairon, D.; Baudry, J.; Kesse-Guyot, E. Environmental Impacts of Plant-Based Diets: How Does Organic Food Consumption Contribute to Environmental Sustainability? Front. Nutr. 2018, 5, 8.
20. Fehér, A.; Gazdecki, M.; Véha, M.; Szakály, M.; Szakály, Z. A Comprehensive Review of the Benefits of and the Barriers to the Switch to a Plant-Based Diet. Sustainability 2020, 12, 4136.
21. Scarborough, P.; Appleby, P.N.; Mizdrak, A.; Briggs, A.D.M.; Travis, R.C.; Bradbury, K.E.; Key, T.J. Dietary Greenhouse Gas Emissions of Meat-Eaters, Fish-Eaters, Vegetarians and Vegans in the UK. Clim. Change 2014, 125, 179–192.
22. Kumar, M.; Sharma, M.; Raut, R.D.; Mangla, S.K.; Choubey, V.K. Performance Assessment of Circular Driven Sustainable Agri-Food Supply Chain towards Achieving Sustainable Consumption and Production. J. Clean. Prod. 2022, 372, 133698.
23. Kazancoglu, Y.; Ekinci, E.; Mangla, S.K.; Sezer, M.D.; Kayikci, Y. Performance Evaluation of Reverse Logistics in Food Supply Chains in a Circular Economy Using System Dynamics. Bus. Strateg. Environ. 2020, 30, 71–91.

24. Ivo de Carvalho, M.; Relvas, S.; Barbosa-Póvoa, A.P. A Roadmap for Sustainability Performance Assessment in the Context of Agri-Food Supply Chain. Sustain. Prod. Consum. 2022, 34, 565–585.
25. Noya, L.I.; Vasilaki, V.; Stojceska, V.; González-García, S.; Kleynhans, C.; Tassou, S.; Moreira, M.T.; Katsou, E. An Environmental Evaluation of Food Supply Chain Using Life Cycle Assessment: A Case Study on Gluten Free Biscuit Products. J. Clean. Prod. 2018, 170, 451–461.
26. Cecchini, L.; Venanzi, S.; Pierri, A.; Chiorri, M. Environmental Efficiency Analysis and Estimation of CO2 Abatement Costs in Dairy Cattle Farms in Umbria (Italy): A SBM-DEA Model with Undesirable Output. J. Clean. Prod. 2018, 197, 895–907.
27. Houssard, C.; Maxime, D.; Benoit, S.; Pouliot, Y.; Margni, M. Comparative Life Cycle Assessment of Five Greek Yogurt Production Systems: A Perspective beyond the Plant Boundaries. Sustainability 2020, 12, 9141.
28. Mohammed, A.; Harris, I.; Govindan, K. A Hybrid MCDM-FMOO Approach for Sustainable Supplier Selection and Order Allocation. Int. J. Prod. Econ. 2019, 217, 171–184.
29. Chen, Y.; Wang, S.; Yao, J.; Li, Y.; Yang, S. Socially Responsible Supplier Selection and Sustainable Supply Chain Development: A Combined Approach of Total Interpretive Structural Modeling and Fuzzy Analytic Network Process. Bus. Strateg. Environ. 2018, 27, 1708–1719.
30. Moazzam, M.; Akhtar, P.; Garnevska, E.; Marr, N.E. Measuring Agri-Food Supply Chain Performance and Risk through a New Analytical Framework: A Case Study of New Zealand Dairy. Prod. Plan. Control 2018, 29, 1258–1274.
31. Kazancoglu, Y.; Sagnak, M.; Mangla, S.K.; Sezer, M.D.; Pala, M.O. A Fuzzy Based Hybrid Decision Framework to Circularity in Dairy Supply Chains through Big Data Solutions. Technol. Forecast. Soc. Change 2021, 170, 120927.
32. Gupta, H.; Kumar, A.; Wasan, P. Industry 4.0, Cleaner Production and Circular Economy: An Integrative Framework for Evaluating Ethical and Sustainable Business Performance of Manufacturing Organizations. J. Clean. Prod. 2021, 295, 126253.
33. Kumar, S.; Raut, R.D.; Nayal, K.; Kraus, S.; Yadav, V.S.; Narkhede, B.E. To Identify Industry 4.0 and Circular Economy Adoption Barriers in the Agriculture Supply Chain by Using ISM-ANP. J. Clean. Prod. 2021, 293, 126023.
34. Sufiyan, M.; Haleem, A.; Khan, S.; Khan, M.I. Evaluating Food Supply Chain Performance Using Hybrid Fuzzy MCDM Technique. Sustain. Prod. Consum. 2019, 20, 40–57.
35. Bloemhof, J.M.; van der Vorst, J.G.A.J.; Bastl, M.; Allaoui, H. Sustainability Assessment of Food Chain Logistics. Int. J. Logist. Res. Appl. 2015, 18, 101–117.

36. Jouzdani, J.; Govindan, K. On the Sustainable Perishable Food Supply Chain Network Design: A Dairy Products Case to Achieve Sustainable Development Goals. J. Clean. Prod. 2021, 278, 123060.
37. Negri, M.; Cagno, E.; Colicchia, C.; Sarkis, J. Integrating Sustainability and Resilience in the Supply Chain: A Systematic Literature Review and a Research Agenda. Bus. Strateg. Environ. 2021, 30, 2858–2886.
38. Sharma, V.; Raut, R.D.; Mangla, S.K.; Narkhede, B.E.; Luthra, S.; Gokhale, R. A Systematic Literature Review to Integrate Lean, Agile, Resilient, Green and Sustainable Paradigms in the Supply Chain Management. Bus. Strateg. Environ. 2021, 30, 1191–1212.
39. Dev, N.K.; Shankar, R.; Qaiser, F.H. Industry 4.0 and Circular Economy: Operational Excellence for Sustainable Reverse Supply Chain Performance. Resour. Conserv. Recycl. 2020, 153, 104583.
40. Miranda-Ackerman, M.A.; Azzaro-Pantel, C.; Aguilar-Lasserre, A.A.; Bueno-Solano, A.; Arredondo-Soto, K.C. Green Supplier Selection in the Agro-Food Industry with Contract Farming: A Multi-Objective Optimization Approach. Sustainability 2019, 11, 7017.
41. Kumar, A.; Mangla, S.K.; Kumar, P.; Karamperidis, S. Challenges in Perishable Food Supply Chains for Sustainability Management: A Developing Economy Perspective. Bus. Strateg. Environ. 2020, 29, 1809–1831.
42. Qorri, A.; Mujkić, Z.; Kraslawski, A. A Conceptual Framework for Measuring Sustainability Performance of Supply Chains. J. Clean. Prod. 2018, 189, 570–584.
43. Cicatiello, C.; Franco, S.; Pancino, B.; Blasi, E.; Falasconi, L. The Dark Side of Retail Food Waste: Evidences from in-Store Data. Resour. Conserv. Recycl. 2017, 125, 273–281.
44. Choubey, V.K.; Kumar, M. Modelling the Interaction among the Key Performance Indicators of Sustainable Supply Chain in Perspective of Perishable Food. Int. J. Logist. Syst. Manag. 2023, 45, 108–130.
45. Govindan, K.; Khodaverdi, R.; Jafarian, A. A Fuzzy Multi Criteria Approach for Measuring Sustainability Performance of a Supplier Based on Triple Bottom Line Approach. J. Clean. Prod. 2013, 47, 345–354.
46. Kumar, M.; Choubey, V.K. Analysis of Sustainable Performance Indicators in Dairy Supply Chain Using Fuzzy-DEMATEL. Int. J. Logist. Syst. Manag. 2022, 1, 1.
47. Morrison-Saunders, A.; Pope, J. Conceptualising and Managing Trade-Offs in Sustainability Assessment. Environ. Impact Assess. Rev. 2013, 38, 54–63.
48. Waas, T.; Hugé, J.; Block, T.; Wright, T.; Benitez-Capistros, F.; Verbruggen, A. Sustainability Assessment and Indicators: Tools in a Decision-Making Strategy for Sustainable Development.

Sustainability 2014, 6, 5512–5534.

49. Moldavska, A.; Welo, T. A Holistic Approach to Corporate Sustainability Assessment: Incorporating Sustainable Development Goals into Sustainable Manufacturing Performance Evaluation. J. Manuf. Syst. 2019, 50, 53–68.
50. Kumar, M.; Choubey, V.K.; Raut, R.D.; Jagtap, S. Enablers to Achieve Zero Hunger through IoT and Blockchain Technology and Transform the Green Food Supply Chain Systems. J. Clean. Prod. 2023, 405, 136894.
51. Uygun, Ö.; Dede, A. Performance Evaluation of Green Supply Chain Management Using Integrated Fuzzy Multi-Criteria Decision Making Techniques. Comput. Ind. Eng. 2016, 102, 502–511.
52. Stohler, M.; Rebs, T.; Brandenburg, M. Toward the Integration of Sustainability Metrics into the Supply Chain Operations Reference (SCOR) Model. In Greening of Industry Networks Studies; Springer: Berlin/Heidelberg, Germany, 2018; Volume 5, pp. 49–60.