

Sustainable Reverse Logistics and Operational Performance: A Conceptual Framework

Nur Ilyana Amiiraa Nordin^{1*}, Nur Aisyah Binti Mohd Rofi², Norfaizal Hermy Nordin³, Mohd Hasrul Hafiz Che Awang⁴

^{1,2}Fakulti Pengurusan Teknologi dan Teknousahawanan, Universiti Teknikal Malaysia Melaka

³Faizal Hermy Enterprise

⁴G & K Infra Earthwork Sdn Bhd

DOI: <https://doi.org/10.47772/IJRISS.2026.100900151>

Received: 05 September 2026; Accepted: 10 September 2026; Published: 04 October 2026

ABSTRACT

Sustainable Reverse Logistics (SRL) has become increasingly important for manufacturing firms seeking to improve operational efficiency while responding to growing environmental and sustainability pressures. This conceptual study examines the potential contribution of SRL practices to operational performance by integrating insights from the Sustainable Reverse Logistics and sustainable supply chain literature. Particular attention is given to three core SRL practices: return management, reuse and recycling, and waste management. These practices are conceptually linked to operational outcomes such as cost efficiency, productivity, process effectiveness, resource utilisation, and responsiveness. Drawing on the Resource-Based View (RBV) and Natural Resource-Based View (NRBV), the study proposes that SRL practices can be regarded as strategic organisational capabilities that enable firms to recover value, minimise waste, optimise resource utilisation, and strengthen operational processes. The framework further considers Sustainable Supply Chain Initiatives (SSCI) as complementary capabilities that may reinforce the contribution of SRL practices to operational performance. Although firms may face barriers related to financial resources, technological capability, infrastructure, technical expertise, organisational coordination, and managerial commitment, the effective integration of SRL and broader sustainability initiatives may strengthen operational resilience and competitiveness. The study develops an integrated conceptual framework and propositions that provide a theoretical foundation for future empirical investigation in manufacturing contexts.

Keywords- Sustainable Reverse Logistics, Operational Performance, Product Return Management, Reuse, Recycling, Sustainable Supply Chain.

INTRODUCTION

The current business environment is characterized by intense competition and growing concerns over environmental sustainability, compelling manufacturing firms to pursue operational efficiency and profitability while simultaneously strengthening their environmental responsibility. Therefore, organisations must improve the way they function and include sustainable practices in business operations. As highlighted by Mbago et al. (2025), responsive productivity, waste minimisation, process throughput, and overall cost efficiency are some of the primary determinants that can influence the success of an organisation, especially in the manufacturing and logistics sectors. The operational dimensions are crucial to understanding whether the company is using its resources efficiently and managing its supply chain in a sustainable way in a growing sustainability aware business world.

Sustainable Reverse Logistics (SRL) is one of the new concepts that has attracted more attention in the field of sustainable operational excellence. SRL includes activities such as collection, sorting, reprocessing, redistribution, and environmentally responsible disposal of products and further considers economic and social factors (Prajapati et al., 2022). If the activities are managed effectively, it can help minimise environmental

impacts and may help companies to recover residual value from products and materials, which helps to improve resource efficiency and reduce operational costs (Mbago et al., 2025).

In addition to SRL, Sustainable Supply Chain Initiatives (SSCI) refer to various strategic initiatives aimed at incorporating sustainability into the supply chain process and activities, such as green sourcing, eco-friendly packaging, supplier engagement, and lifecycle assessment (Richnák and Gubová, 2021). This makes it relevant to analyze the link between SRL, SSCI, and operational performance in order to understand the contribution of sustainable supply chain practices to enhance the operational performance and long-term competitiveness of organizations.

Despite increasing scholarly attention to sustainable reverse logistics, the existing literature remains fragmented in explaining how different SRL practices collectively contribute to operational performance. Return management, reuse and recycling, and waste management are frequently discussed as individual activities, while their integration with broader Sustainable Supply Chain Initiatives remains comparatively underdeveloped. This creates an important conceptual gap because operational improvements may depend not only on isolated reverse-logistics practices but also on the configuration of complementary organisational and supply-chain capabilities.

Unlike prior studies that primarily examined reverse logistics and SSCI in relation to sustainability performance, this study focuses on the conceptual links between specific SRL practices, SSCI, and operational performance in manufacturing firms.

BACKGROUND OF STUDY

Manufacturing firms are increasingly expected to achieve operational efficiency while responding to growing environmental concerns, resource constraints, and sustainability requirements. In this environment, firms are required not only to manage forward flows of materials and products efficiently but also to address products, components, packaging, and materials that return from customers or reach the end of their useful life. Sustainable Reverse Logistics (SRL) has therefore emerged as an important approach for managing these reverse flows through activities such as collection, sorting, inspection, reuse, recycling, remanufacturing, redistribution, and environmentally responsible disposal. These activities can enable firms to recover residual value from returned products, reduce unnecessary waste, extend product and material life cycles, and improve resource utilisation (Prajapati et al., 2022; Melo et al., 2022).

The operational relevance of SRL is particularly important in manufacturing because product returns, production waste, unused components, packaging materials, and end-of-life products may represent both operational costs and potential sources of recoverable value. Return management enables firms to evaluate, sort, and determine appropriate recovery options for returned products, including resale, reuse, recycling, or disposal. Technology-supported return systems can further improve monitoring and decision-making regarding product recovery (Akoth & Somba, 2023; Nanayakkara et al., 2022; Sapry, 2023). Similarly, reuse and recycling can extend material life cycles, reduce dependence on virgin resources, and lower disposal requirements, while effective waste-management practices can improve sorting, transportation, material recovery, and process efficiency (Modak et al., 2023; Lu et al., 2022; Govindan et al., 2022).

Despite these potential benefits, implementing SRL effectively can be complex. Reverse flows are often characterised by uncertainty regarding the timing, quantity, quality, and condition of returned products, while firms may also face technological, infrastructure, financial, and coordination constraints. Dabees et al. (2023) highlight the importance of organisational and service capabilities in developing effective sustainable reverse-logistics systems, while Firdous and Ramish (2023) identify issues such as inadequate information systems, logistics complexity, and weaknesses in reverse-logistics arrangements. Evidence discussed in the present manuscript also indicates that manufacturing and related supply-chain settings may experience difficulties in developing effective recovery and waste-management systems. These challenges suggest that the operational

contribution of SRL depends not only on whether individual practices are adopted, but also on how effectively they are supported and coordinated within the organisation and its wider supply chain.

For this reason, Sustainable Supply Chain Initiatives (SSCI) are also relevant to the implementation of SRL. SSCI incorporate environmental and sustainability considerations into broader supply-chain activities through practices such as green purchasing, green manufacturing, sustainable packaging, and coordination among supply-chain partners (Hsu et al., 2016; Yang et al., 2024). Such initiatives extend sustainability beyond the boundaries of an individual firm and can create conditions that support product recovery, resource efficiency, information sharing, and collaboration across the supply chain. Previous research has shown that sustainable supply-chain practices and green supply-chain integration can contribute to operational and organisational performance, while SSCI may also support reverse-logistics activities by strengthening coordination and sustainable resource use (Hsu et al., 2016; Kumar et al., 2019; Abbas et al., 2023).

From a strategic perspective, these developments suggest that SRL should not be viewed merely as a waste-disposal or environmental-compliance activity. Rather, return-management systems, recycling and reuse capabilities, waste-management routines, technological resources, and sustainability-oriented supply-chain coordination can be considered organisational capabilities that may support operational performance. This interpretation is consistent with the Resource-Based View (RBV), which emphasises the strategic value of organisational resources and capabilities, and the Natural Resource-Based View (NRBV), which extends this reasoning to environmentally oriented capabilities (Barney, 1991; Hart, 1995).

Against this background, the present study focuses on three central SRL practices—return management, reuse and recycling, and waste management, together with Sustainable Supply Chain Initiatives and their conceptual relationship with operational performance. Operational performance is considered in terms of cost efficiency, productivity, responsiveness, resource utilisation, and process effectiveness. By integrating these elements through the RBV and NRBV perspectives, the study provides a conceptual basis for understanding how sustainability-oriented capabilities may contribute to the operational performance of manufacturing firms. The specific limitations in the existing literature and the need for the proposed integrated framework are further developed in the following Problem Statement.

Problem Statement

Manufacturing firms are increasingly expected to improve operational efficiency while simultaneously responding to environmental and sustainability pressures. Sustainable Reverse Logistics (SRL) provides an important mechanism for recovering value from returned and end-of-life products through practices such as return management, reuse, recycling, remanufacturing, and waste recovery.

However, effective implementation remains challenging because reverse logistics involves uncertainty in product returns, complex recovery activities, technological requirements, and coordination across supply-chain actors. Recent research therefore emphasises the need to view reverse logistics as an integrated organisational capability rather than merely as a waste-disposal activity (Sun et al., 2022; Dabees et al., 2023).

Although previous studies generally suggest that reverse-logistics practices can improve operational outcomes, the literature remains fragmented regarding the contribution of specific SRL practices. A recent systematic review found that prior research often concentrates on broad reverse-logistics activities and gives comparatively limited attention to the individual operational effects of practices such as reuse, recycling, remanufacturing, and return management (Machiso et al., 2024).

Furthermore, Yang et al. (2024) examined the relationships among reverse logistics, Sustainable Supply Chain Initiatives (SSCI), and sustainability performance, with organisational learning capability as a moderator. While their study provides important evidence concerning sustainability outcomes, less attention is given to how distinct SRL practices and SSCI can be conceptually integrated to explain operational performance, including cost efficiency, productivity, responsiveness, resource utilisation, and process effectiveness.

Accordingly, there is a need for a more integrated conceptual explanation of how return management, reuse and recycling, and waste management, together with broader Sustainable Supply Chain Initiatives, may contribute to operational performance in manufacturing firms. Drawing on the Resource-Based View (RBV) and Natural Resource-Based View (NRBV), this study conceptualises these practices as complementary organisational and sustainability-oriented capabilities. The study therefore develops a conceptual framework linking SRL practices and SSCI with operational performance and formulates propositions that provide a foundation for future empirical testing.

Research Question

The research questions addressed in this study on the influence of sustainable reverse logistics on operational performance are as follows:

- How may Sustainable Reverse Logistics practices, particularly return management, reuse and recycling, and waste management, contribute to the operational performance of manufacturing firms?
- How may Sustainable Supply Chain Initiatives contribute to the operational performance of manufacturing firms?
- How may the integration of Sustainable Reverse Logistics practices and Sustainable Supply Chain Initiatives strengthen operational performance in manufacturing firms?

Research Objective

The research objectives outlined in the study are as follows:

- To conceptualize the relationship between Sustainable Reverse Logistics practices and operational performance in manufacturing firms.
- To examine conceptually the contribution of Sustainable Supply Chain Initiatives to the operational performance of manufacturing firms.
- To develop an integrated conceptual framework explaining how Sustainable Reverse Logistics practices and Sustainable Supply Chain Initiatives may jointly contribute to operational performance in manufacturing firms.

Conceptual Review Approach

This study adopts a conceptual integrative review approach to synthesise existing knowledge on Sustainable Reverse Logistics (SRL), Sustainable Supply Chain Initiatives (SSCI), and operational performance. This approach is appropriate because the study aims to integrate fragmented literature, clarify relationships among key constructs, and develop theoretically grounded propositions rather than statistically test empirical relationships. The review is organised around three core SRL practices—return management, reuse and recycling, and waste management and their potential contribution to operational outcomes such as cost efficiency, responsiveness, resource utilisation, productivity, and process effectiveness. This approach is consistent with the principles of integrative and conceptual review research outlined by Torraco (2005), Snyder (2019), and Jaakkola (2020).

The synthesis is theoretically grounded in the Resource-Based View (RBV) and Natural Resource-Based View (NRBV), which explain how organisational resources, sustainability-oriented capabilities, and supply-chain collaboration may contribute to operational performance. Relevant literature on SRL, SSCI, circular economy practices, and manufacturing operations is critically integrated to identify recurring relationships and complementary capabilities. The resulting synthesis provides the basis for developing the study's conceptual propositions and proposed framework linking SRL practices, SSCI, and operational performance, while

recognising that these relationships require future empirical validation (Snyder, 2019; Jaakkola, 2020).

LITERATURE REVIEW

Introduction

This section reviews the relevant literature on operational performance and Sustainable Reverse Logistics (SRL). It further examines the key SRL practices and Sustainable Supply Chain Initiatives (SSCI), establishes the theoretical foundation of the study, and provides the literature basis for developing the conceptual propositions and proposed framework.

Operational Performance

Operational performance is defined by the extent to which an organization effectively coordinates and optimizes its internal processes to meet established strategic and operational goals. Key aspects of operational performance encompass product development, quality management, process improvement, and lead-time reduction (Duong, 2022). It also involves the efficient allocation of resources, cost control, delivery timeliness, adaptability, and quality assurance. These elements collectively contribute to a firm's competitive standing and its long-term viability. Research by Sarangih et al. (2020) indicates that horizontal and vertical supply chain integration (SCI) can substantially improve operational performance by bolstering technological, logistical, and structural capacities. When these capacities align with strategic objectives such as cost leadership or differentiation, companies can effectively lower operational expenses while enhancing product quality.

Furthermore, Mangla et al. (2020) underscore the impact of advanced technologies, including blockchain, the Internet of Things (IoT), and big data analytics, on augmenting operational transparency, responsiveness, and agility. These technologies facilitate real-time decision-making and promote more efficient resource utilization, thereby supporting sustainable operations, particularly in green and reverse logistics. In a similar, Habib et al. (2020) posit that internal environmental management (IEM) practices such as interdepartmental cooperation, diligent application of environmental policies, and robust commitment from senior management are critical for enhancing operational performance. Practices like eco-design and green collaboration also contribute to environmental goals through waste minimization, process streamlining, and improved overall organizational outcomes.

Nevertheless, emerging studies suggest that social sustainability practices, including efforts to ensure employee health, safety, well-being, and ethical treatment, can generate positive operational outcomes. Duong (2022) indicates that an ethical work environment and strong employee engagement may contribute to higher productivity, lower operational risks, and improved process efficiency. These improvements can subsequently lead to cost savings, shorter lead times, and greater delivery reliability. Based on the Trivellas et al. (2020) link between financial and social value creation and operational strategies such as green packaging, supply chain optimisation, and logistics network design, providing a more integrated perspective on sustainability and operational performance. Their findings suggest that while some practices, such as green warehousing, may have a relatively limited direct effect on sustainability, other practices, including route optimisation and environmentally friendly packaging, can make a stronger contribution to operational sustainability.

Sustainable Reverse Logistics

Sustainable Reverse Logistics (SRL) is the process of managing the flow of products and services in the direction of the traditional supply chain. This means dealing with the reuse, resale, remanufacturing, recycling and disposal of products and services. Sustainable Reverse Logistics seeks to capture value and reduce the impacts by recovering and reusing materials and putting them back into production systems. SRL is a part of the circular economy, which supports closed-loop supply chains that help to make products last longer reduce waste and use resources more efficiently (Hashemi, 2021). There are laws and regulations such as the

European Union Waste Framework Directive, that require companies to have organised reverse logistics systems in place focusing on reducing waste and retrieving products (Hashemi, 2021)

At the time consumers are changing the way they think about products and businesses are being forced to make their supply chains more sustainable. Consumers care more about the impact of products and want to know what happens to them when they are returned or disposed of according to Alarcón et al., (2021a). Companies that recycle remanufacture and recover products in a way are more likely to gain the trust of their customers and build brand loyalty (Shahparvari et al., 2021b). The pressure from the market has made consumers more aware of issues and sustainability has become a key factor in competing with other businesses as well as a way to build a good reputation (Hashemi, 2021). This has led companies to be more open about their Reverse Logistics programs, such as getting environmental certifications and explaining how they are reducing their impact on the environment in order to meet the demands of consumers and stay relevant in the market (Alarcón et al., 2021a).

Recently, regulatory requirements and consumer expectations have shifted towards making Reverse Logistics a necessary part of designing a supply chain strategy (Shahparvari et al., 2021b and Hashemi, 2021). Sustainable Reverse Logistics has become essential in managing supply chains mainly because it helps to address world environmental problems like pollution, waste and greenhouse gases. By reusing, remanufacturing and recycling products Sustainable Reverse Logistics helps companies to recover value from products that have reached the end of their lives and reduces the need for landfills, which in turn minimizes the negative impact on the environment according to Hashemi, (2021) In industries where waste can cause harm to the environment and human health such as electronics, Sustainable Reverse Logistics provides a responsible way to dispose of unwanted materials rather than using informal methods. It ensures that hazardous materials are handled and disposed of in a manner, which is often not the case with electronic waste (Maheswari et al., 2020).

Another advantage of SRL is its ability to cut down on carbon emissions a lot. Companies can lower the amount of emissions that come from making products and burning waste by using ways to move goods and recover materials. This is very important because there is more pressure around the world like carbon taxes, that push companies to lower their impact on the environment by running their businesses in a greener way (Shahparvari et al., 2021b). Along with following rules and cutting down on harm using Sustainable Resource Logistics methods helps companies make things efficiently throw away less and think more about the environment. The part that Sustainable Resource Logistics plays in plans, for sustainability helps companies not only protect the environment but also make their supply chains stronger (Alarcón et al., 2021a; Hashemi, 2021).

Key concepts

Return Management

Over the years people have been paying attention to making sure that the process of handling returns is done in a way that is good for the environment. This is especially important now that more people are shopping online and companies are sending products directly to consumers. One key part of this process is called gatekeeping, which's when companies decide which products can be sent back. Gatekeeping is very important. It works well when companies have good information about their products and they treat their customers well. This helps to prevent people from sending back things they should not. It also helps to reduce waste in the shipping process (Nanayakkara et al., 2022). According to Akoth and Somba (2023) to make this process even better, companies can have a policy for returns, which includes things like needing a receipt and a time limit for sending things back. This helps companies to control how many things are sent back. It prevents people from taking advantage of the system. It also helps to reduce costs.

In order to understand how gatekeeping helps with handling returns, it needs to look at why people send things in the first place. According to Sapry (2023), some of the reasons people return products are because they are

defective or do not work well. Sometimes products are not safe. Some of the products are near the expiration date. If companies make products, they will have fewer problems with defects and they will not have to fix as many things. This means that fewer products will be sent back. It is also very important to make sure that products are safe in industries, like pharmaceuticals. Companies need to follow the rules and test the products to make sure they are safe for people to use.

Besides reducing returns, companies also use return avoidance strategies to better manage their operations. This includes using tools and technologies like product trials, augmented reality and other improvements to make sure the product experience matches what people expect (Nanayakkara et al. 2022). Good planning makes it more likely to collect these returns even when it can't be avoided. The environmental impact and financial success of logistics systems depend on where return hubs are located, how strong the logistics infrastructure is and how well third parties are controlled. There are two models of returns described by Bian and Xiao (2025): the collection buy-back approach, where online retailers handle returns and send them to the manufacturer and the direct return, where customers send items back to the manufacturer. The direct model works better when the cost of shipping is low and the customer is upset which helps speed up checking the items and getting them back, into use. It also avoids using a person.

The management of product returns is a key component of effective reverse logistics, as it enables firms to systematically inspect, sort, and determine suitable options for returned products, including resale, reuse, recycling, or disposal (Akoth & Somba, 2023; Nanayakkara et al., 2022). Such practices help reduce waste, recover product value, and improve resource efficiency. Furthermore, the use of technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and advanced analytics can support real-time monitoring and improve decisions regarding product recovery. These technologies are particularly beneficial for perishable and highly regulated products, such as food and pharmaceuticals (Sapry, 2023). Therefore, effective returns management supported by digital technologies can contribute to more efficient, sustainable, and cost-effective reverse logistics operations.

Collectively, the literature suggests that return management should be considered not merely as a mechanism for processing returned products but as an organisational capability that may contribute to operational performance. Effective return-management systems can facilitate value recovery, reduce unnecessary logistics costs, improve resource utilisation, and support more informed recovery decisions (Akoth & Somba, 2023; Nanayakkara et al., 2022). From an RBV perspective, firms that develop specialized return-management knowledge, information systems, and coordination capabilities may therefore achieve operational advantages through more efficient management of reverse product flows (Barney, 1991).

Reuse and Recycling

Reuse

The aspect of reuse makes a significant part of sustainable reverse logistics (SRL) since the materials may be used in lower energy intensities as the materials course through their life cycles. Modak et al. (2023) argue that reuse is a process of using items without any processing, which is tantamount to increasing their operational span and also minimises the need to use new resources. A real-life example is the redistribution of products, books, and clothing by community organizations that will fit SRL objectives as they will result in a lower need for new manufacturing and less emission of transportation concerned with their offered returns. An outstanding illustration of manufacturing-proximate regimes is the Swedish deposit-refund system (DRS) of polypropylene (PP) food containers in hotels, restaurants, and cafes (Lu et al., 2022).

Under DRS system, the dirty containers returned to the restaurants involved are cleaned after use and reused by customers. The system is followed up online, making it accountable and efficient. The system with a 98% return rate shows that digital tools and the involvement of the user can increase its reverse logistics performance in SRL systems considerably. Another supply chain practice involving the reuse of products within the industrial supply chain is also very vital in cutting down the costs of operation and increasing the

efficiency of the supply chain. According to Ishola (2019), most manufacturing waste, including rigid packaging, plastic crates, and surplus components, can be reused within the company or traded between other firms via waste exchange databases. This helps the firms to cut down on the consumption of virgin materials, reduce the cost of waste disposal of the wastes and increase the inventory turnover. Reuse solutions minimize the needless movement of products and acquisition, and this guideline helps directly in lean operation as well as is environmentally friendly.

Recycling

Although more resource-intensive compared to reuse, recycling is a crucial element of sustainable reverse logistics because it transforms the waste into reusable raw materials. Modak et al. (2023) argue that recycling lessens the reliance on primary resources and facilitates active-loop supply chains. Reverse vending machines (RVMs) in Sweden are used to recycle PET trays, which can be used to produce food-grade products (Lu et al., 2022). Despite the higher infrastructure and operational costs, where the benefit-cost ratio is 0.73, the system still enjoys a 90% recovery rate. There are different examples of plastic recycling in the construction industry, as seen by

Recycling and reuse, as part of Circular Economy Business Models (CEBM), provide a system structure for sustainable reverse logistics. As described by Modak et al. (2023), CEBMs concentrate on post-consumer collection to reuse, redistribution, recycle, and refurbish materials to minimise material flow and waste. Regarding the SRL principles, these models aim to achieve loop closure and ensure that materials are utilised to their maximum potential. Lu et al. (2022) demonstrate how the DRS systems in Sweden implement circular economy ideals by keeping plastic packaging in the flow via reuse or recycling. The industrial application of Lamba et al. (2022) is the work of construction sites: the use of plastic waste materials to create eco-brick and pavement blocks and reuse them on the territory. Besides giving environmental advantages, these CEBMs would allow easier handling of logistics and reasonable anticipation of channels back, harvest and redistribution, which are the central functions of SRL systems.

From an operational perspective, reuse and recycling may contribute to improved resource productivity by extending material life cycles, reducing dependence on virgin resources, lowering disposal requirements, and recovering economic value from used products and materials (Modak et al., 2023; Lu et al., 2022). When supported by appropriate infrastructure, technology, and organisational routines, these practices may function as sustainability-oriented capabilities that simultaneously support environmental objectives and operational efficiency. From the NRBV perspective, such capabilities can create organisational value by integrating environmental considerations into resource-management strategies (Hart, 1995).

Waste Management

Waste management is also a major pillar of sustainable reverse logistics (SRL) and an important aspect of optimising operations in manufacturing companies. Adoption of waste management processes, including sorting of materials, efficient transportation methods, circular logistics architecture, reprocessing of materials, and digital solutions, has a dual benefit of achieving environment-related objectives and creating distinct operational benefits, such as cost savings, efficiency of the logistics, and more efficient use of resources. Sorting and source separation is important in terms of the efficiency of the process and the quality of material at the first point of the waste flow. The sorting is systematic, and as indicated by Muhammad et al. (2023), it keeps contamination to a minimum, and the downstream processes, such as recycling and remanufacturing, often work more effectively. Mkunyana and Ngema (2025) demonstrate, however, that not all manufacturing companies have organised segregation strategies. Specifically, 27.3 per cent of the companies mix all types of waste into one waste bin and 9.2 per cent use colour-coded waste bins.

Optimisation of transportation is the other important component. Effective routing minimises the expenditure on spending less and harming the environment. According to Muhammad et al. (2023), the utilisation of real-time monitoring systems by the logispreneurs in Malaysia has resulted in a decrease in the amount of fuel

utilised by 15 per cent. Building on this observation, Kim et al. (2023) mention introducing smart bins facilitated by IoT, which provide real-time fill-level information used to optimise routes and collections. They propose some new advanced operational strategies like Clustered Vehicle Routing Problem (CluVRP), k-means clustering and Ant Colony Optimization (ACO), which enable them to make dynamic optimisations of the waste-collection routes based on the status of bins and the vehicles of the capacity. The internal and external transportation of production waste, scrap, and returned materials may also be coordinated by means of similar intelligent systems in the manufacturing environment so that responsiveness and inefficiencies in routing may be enhanced.

The circular logistics design provides a sustainable value of operations since it can operate with materials through recycling, energy recovery systems, and reuse. According to Govindan et al. (2022) such a framework allows for a shift to a circular economy, sealing the material loops and reducing the reliance on landfills. Nonetheless, Mkunanya and Ngema (2025) state that only a minority of manufacturing companies recover the waste; on the contrary, the companies mostly forgo waste and deploy it directly into the environment (35%) or engage in recycling (21.3%) with a few per cent applying recovery (8.2%) strategies. These figures clearly define the necessity of a more deliberate approach to reverse logistics in order to minimize the costs of raw materials and guarantee environmental regulations as well as the sustainability of operations in a long-term perspective.

Recycling and remanufacturing practices are other practices under reprocessing that play a significant connection between the management of waste and the operational aspects of performance. These actions minimise the use of virgin materials and make it easier to extend the material lifecycle and observe, companies with intensive recycling and remanufacturing practices experienced a 30 per cent increase in material recovery rates. Similarly, Govindan et al. (2022) report comparable improvements with regard to hazardous medical waste, where reverse logistic processes convert the waste to useful material. Such practices lead to tangible changes in the manufacturing process, including decreased costs of input, minimized contributions to the landfills, and stabilized production input by salvaging resources.

The integrative use of technology is a horizontal facilitating force in all these functions of waste management. Kim et al. (2023) indicate that an adaptive logistics planning system with a fast data analysis capacity using IoT-based innovative bin solutions promotes efficient collection of waste. Their application of clustering algorithms (e.g. k-means), metaheuristic search problem, allows scalable, optimized generation of routes over large-scale systems. When applied to manufacturing, such technologies allow predictive scheduling of re-inputs of production waste and post-consumer products, adding traceability, accuracy, and logistics capabilities. Govindan et al. (2022) also support the application of decision models and queuing theory to minimize the occurrence of bottlenecks and emissions when experiencing large volumes of waste collection, especially in time-stressing conditions.

The literature therefore indicates that waste management should be integrated into the broader SRL system rather than treated solely as an environmental compliance activity. Efficient sorting, transportation, recovery, recycling, and technology-supported waste management may reduce operational costs, improve resource utilisation, and enhance process efficiency (Muhammad et al., 2023; Kim et al., 2023; Govindan et al., 2022). These capabilities are consistent with the NRBV perspective, which argues that environmentally oriented organizational capabilities can contribute to both environmental improvement and competitive value (Hart, 1995).

Sustainable Supply Chain Initiative

Sustainable Supply Chain Initiatives (SSCI) refer to coordinated practices designed to integrate environmental and sustainability considerations across supply-chain activities. In the literature, SSCI has commonly been represented through practices such as green purchasing, green manufacturing, and green packaging (Hsu et al., 2016; Yang et al., 2024). These initiatives extend sustainability beyond the boundaries of a single firm by encouraging environmentally responsible sourcing, cleaner production, reduced use of hazardous materials,

sustainable packaging, and closer coordination among supply-chain partners. Hsu et al. (2016) further demonstrated that SSCI can support reverse-logistics activities by creating supply-chain conditions that facilitate product recovery and sustainable resource use.

From an operational perspective, SSCI may contribute to improved efficiency by aligning environmental practices with supply-chain processes and resource management. Kumar et al. (2019) found that the integration of sustainable supply-chain practices with operational improvement measures is important for improving operational performance, while Abbas et al. (2023) showed that green supply-chain integration can contribute to organisational performance in manufacturing contexts. More recently, Yang et al. (2024) found that SSCI was positively related to sustainability performance and reverse logistics in manufacturing firms, although their study focused on sustainability performance rather than the specific operational outcomes examined in the present conceptual framework. Accordingly, this study considers SSCI a complementary organisational capability that may strengthen cost efficiency, responsiveness, resource utilisation, productivity, and process effectiveness in manufacturing firms.

Therefore, SSCI should not be viewed merely as a set of environmental practices but as a complementary supply-chain capability that may support operational performance by improving coordination, resource efficiency, and the integration of sustainability objectives across the supply chain. From the RBV and NRBV perspectives, such capabilities may create organisational value when they are effectively embedded within firms' operational and supply-chain processes.

Distinction from Previous Studies and Conceptual Contribution

Yang et al. (2024) provide empirical evidence on the relationships among reverse logistics (RL), Sustainable Supply Chain Initiatives (SSCI), and sustainability performance in manufacturing firms, while also examining the moderating role of organisational learning capability. Their study, based on 451 manufacturing firms in Hebei Province, China, reports positive relationships between RL, SSCI, and sustainability performance. The present study builds on this literature but adopts a different conceptual focus. Specifically, it emphasises three Sustainable Reverse Logistics (SRL) practice domains like return management, reuse and recycling, and waste management, and conceptualizes their potential contribution to operational performance, particularly cost efficiency, productivity, responsiveness, resource utilization, and process effectiveness (Yang et al., 2024).

Furthermore, rather than examining organizational learning capability as a moderating factor, the present study integrates the Resource-Based View (RBV) and Natural Resource-Based View (NRBV) to explain how SRL practices and SSCI may function as complementary organisational and sustainability-oriented capabilities (Barney, 1991; Hart, 1995). The conceptual contribution therefore lies in developing an integrated framework connecting specific SRL practices and SSCI with operational performance and in proposing theoretically grounded relationships for subsequent empirical testing. In this respect, the study complements rather than replicates Yang et al. (2024) by shifting attention from broad sustainability performance to the operational mechanisms through which SRL and SSCI may create organisational value.

THEORETICAL FRAMEWORK

The Resource Based View (RBV) is a well-established strategic management perspective that explains how firms can build and sustain competitive advantage through the effective deployment of internal resources and capabilities. Barney (1991) argues that resources can provide a lasting competitive advantage when they are valuable, rare, difficult to imitate, and non-substitutable (VRIN).

In the context of reverse logistics, capabilities such as technological expertise, environmental knowledge, skilled human resources, and dedicated reverse logistics infrastructure can be regarded as strategic organisational assets. These resources enable firms to manage product returns, recovery, recycling, and remanufacturing activities more efficiently, thereby supporting improved operational performance and long-term sustainability.

For instance, remanufacturing capabilities, product return management capabilities, and waste reduction capabilities are not only difficult for competitors to imitate but also possess distinct contributions to economic and environmental performance (Yang et al., 2023; Saglam, 2023c). Such kinds of internal capabilities enable firms to improve operational efficiency, meet regulatory pressure, and differentiate in sustainability-focused markets.

The Natural Resource-Based View (NRBV), introduced by Hart (1995), extends the Resource-Based View by incorporating the natural environment into the explanation of competitive advantage. The theory proposes that firms can strengthen their competitive position by developing environmental capabilities that are embedded within their strategies and operations. Hart (1995) originally identified three interrelated strategic capabilities: pollution prevention, product stewardship, and sustainable development. Subsequent developments of the NRBV further distinguished clean technology and base-of-the-pyramid engagement as important sustainability-oriented capabilities. McDougall et al. (2021) adopted a four-resource perspective comprising pollution prevention, product stewardship, clean technology, and base-of-the-pyramid engagement. From this perspective, environmental sustainability becomes a strategic source of value when firms develop distinctive capabilities that are difficult for competitors to replicate. These resources are rooted in dynamic capabilities like lifecycle management and eco-innovation, which enable firms to respond to environmental challenges while enhancing their market position. Similarly, Saglam (2023c) emphasizes that strategic reverse logistics capabilities recycling, remanufacturing, and sustainable transportation are rooted in the NRBV model and lead to superior environmental and economic performance directly.

Deployment of Industry 4.0 (I4.0) technologies and Global Value Chain (GVC) participation is increasingly being conceived in the RBV as a source of strategic advantage. Technologies such as AI, IoT, big data analytics, and blockchain are valuable and often inimitable assets that enhance the ability of firms to track, recover, and optimize materials and resources in supply chains (Suchek et al., 2023). These technologies facilitate enhanced decision-making, reduced environmental impact, and enhanced responsiveness in RL systems. At the same time, participation in GVCs exposes firms, particularly SMEs, to exogenous knowledge, best practices, and mutual networks that can be leveraged into complementary assets. Suchek et al. (2023) show that when firms combine internal capabilities (technological readiness) with access to external value chain assets, they are more likely to implement circular economy (CE) practices and realize sustainability goals. This internal-external asset synergy creates a superior competitive advantage, aligned with the RBV's emphasis on resource configurations and complementarities.

By including Industry 4.0 (I4.0) technologies like big data analytics, blockchain, IoT, and AI as intangible, valuable firm resources that facilitate advanced supply chain capabilities, recent literature expands on the RBV. Improved reverse logistics and sustainability practices are facilitated by these technologies, which also make data-driven decision-making, transparency, traceability, and process automation easier (Aryee et al., 2024). Because I4.0 technologies integrate with firm-specific systems and knowledge, they become hard to copy and non-replaceable when integrated into business operations. While some studies (Hammad et al., 2025; Nayak et al., 2023) discuss technological adoption and readiness in general, they don't go into detail about particular 4.0 technologies. However, the strategic positioning is supported by the empirical work of Aryee et al. (2024).

Although RBV has historically placed a strong emphasis on internal capabilities, its contemporary implementation acknowledges the value of external resources that are accessed through inter-organizational partnerships and Global Value Chains (GVCs). According to Aryee et al. (2024) and Hammad et al. (2025), cooperative partnerships spanning national and organizational borders can provide firms with knowledge, best practices, and cutting-edge technologies that they may not have on their own. These externally sourced from outside sources, such as knowledge of green logistics or digital platforms for exchanging product lifecycle data, are viewed as strategic additions to internal resources. By participating in GVCs, businesses can adopt advanced reverse logistics techniques more quickly and adhere more readily to sustainability standards. Additionally, cooperative settings promote co-innovation and shared learning, which raises supply chain responsiveness and transparency (Hammad et al., 2025).

The synergistic value of combining internal and external resources is a key theoretical finding in recent literature. Resource configurations, or how businesses combine various asset types, are becoming increasingly important in the RBV to gain a sustainable competitive edge (Suchek et al., 2023; Aryee et al., 2024). The consistency of RBV and NRBV with firm results is confirmed across various dimensions of performance. The literature reveals that the strategic use of I4.0 technologies and collaborative GVCs can create competitive advantages by enhancing economic, environmental, and social performance, in line with the Triple Bottom Line (TBL) approach (Hammad et al., 2025).

In particular, the reverse logistics competency that is boosted by both internal (green knowledge) and external (logistics partnerships) sources in particular can increase the efficiency of operations, diminish its cost, minimize waste, and raise the corporate sustainability performance (Aryee et al., 2024). Further, Schoder et al. (2019) emphasize the fact that strategic resource openness can contribute to both value creation (on behalf of consumers and ecosystems) and value appropriation (on behalf of firms) since their value is not only established by merely possessing resources but also by accessing, sharing, and configuring resources within and beyond the firm boundaries.

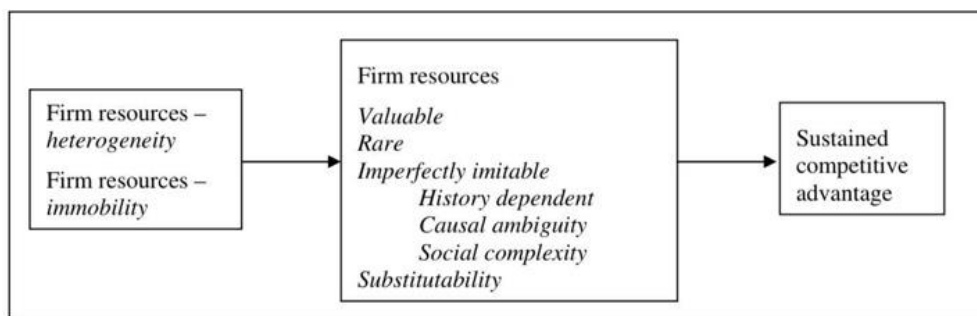


Fig.1 The RBV framework proposed by Barney (1991)

CONCEPTUAL PROPOSITIONS

Sustainable Reverse Logistics and Operational Performance

Sustainable Reverse Logistics practices may contribute to operational performance by enabling firms to recover value from returned products, reduce material losses, minimize waste, and improve resource utilisation. In this study, SRL is represented by three principal practice domains: return management, reuse and recycling, and waste management. These practices can support cost efficiency, responsiveness, productivity, resource utilisation, and process effectiveness through more systematic management of reverse product and material flows. Prior studies have similarly highlighted the operational value of reverse-logistics capabilities and sustainable recovery practices (Hsu et al., 2016; Yang et al., 2024). From the Resource-Based View, organisational capabilities can generate advantages when firms are able to deploy valuable and difficult-to-replicate resources effectively (Barney, 1991). The Natural Resource-Based View further suggests that environmentally oriented capabilities such as pollution prevention, product stewardship, and sustainable resource management may support competitive value (Hart, 1995).

P1: Sustainable Reverse Logistics practices are positively associated with the operational performance of manufacturing firms.

Sustainable Supply Chain Initiatives and Operational Performance

Sustainable Supply Chain Initiatives extend sustainability considerations across supply-chain activities through practices such as environmentally responsible sourcing, green manufacturing, sustainable packaging, supplier collaboration, information sharing, and other sustainability-oriented forms of coordination. These initiatives may improve operational performance by reducing resource inefficiencies, strengthening

coordination among supply-chain partners, improving information flows, and supporting more effective use of materials and organisational resources.

From an RBV perspective, sustainability-oriented supply-chain capabilities may enhance organisational value when they complement internal resources and capabilities. The NRBV similarly suggests that environmentally embedded organisational practices can contribute to competitive and operational outcomes when they are integrated into business processes. Therefore, SSCI may contribute not only to sustainability outcomes but also to operational outcomes such as cost efficiency, responsiveness, resource utilisation, and process effectiveness.

P2: Sustainable Supply Chain Initiatives are positively associated with the operational performance of manufacturing firms.

Integration of SRL and SSCI

The operational benefits of SRL may depend partly on the broader supply-chain environment in which reverse-logistics activities are implemented. Return management, reuse, recycling, and waste recovery require coordination among suppliers, customers, logistics providers, recyclers, and other supply-chain actors. Therefore, sustainability-oriented supply-chain practices such as information sharing, supplier collaboration, technological integration, and environmentally responsible sourcing may complement firms' internal SRL capabilities. The RBV emphasises that combinations of complementary resources may generate greater value than isolated resources, while the NRBV highlights the strategic value of integrating environmental capabilities into organisational and supply-chain processes. Previous literature further highlights the importance of combining internal organizational resources with external partnerships and value-chain capabilities to strengthen sustainability-oriented operational capabilities (Suchek et al., 2023; Aryee et al., 2024). P3: The complementary integration of Sustainable Reverse Logistics practices and Sustainable Supply Chain Initiatives is positively associated with operational performance in manufacturing firms.

PROPOSED CONCEPTUAL FRAMEWORK

Based on the literature synthesis and the propositions developed above, Figure 2 presents the proposed conceptual framework linking Sustainable Reverse Logistics (SRL) practices, Sustainable Supply Chain Initiatives (SSCI), and operational performance. SRL is represented by return management, reuse and recycling, and waste management, while operational performance is reflected through cost efficiency, productivity, responsiveness, resource utilisation, and process effectiveness. The framework proposes that SRL practices contribute to operational performance (P1), SSCI contributes to operational performance (P2), and the complementary integration of SRL and SSCI may further strengthen operational outcomes (P3).

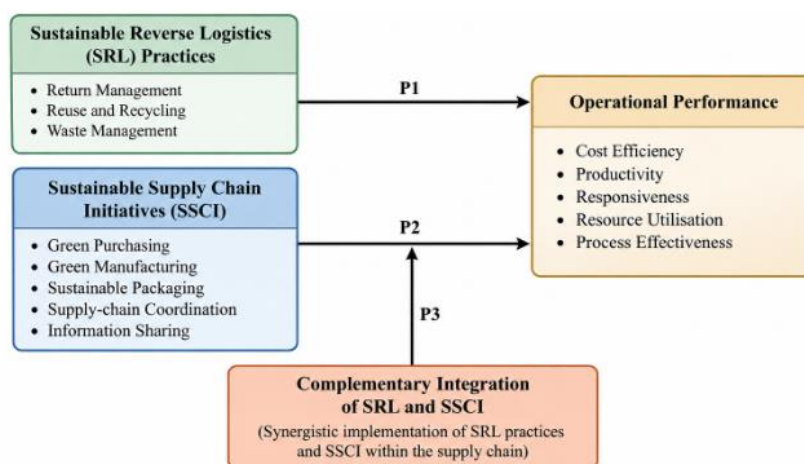


Fig. 2 Proposed Conceptual Framework Linking Sustainable Reverse Logistics Practices, Sustainable Supply Chain Initiatives and Operational Performance

The framework is theoretically grounded in the Resource-Based View and Natural Resource-Based View, which explain how internal organizational capabilities and environmentally oriented resources may create operational value (Barney, 1991; Hart, 1995). The proposed relationships are conceptual and require future empirical validation.

DISCUSSION AND CONCLUSION

The conceptual synthesis suggests that Sustainable Reverse Logistics (SRL) should be viewed as more than an environmental or waste-management activity. When return management, reuse and recycling, and waste management are developed as coordinated capabilities, they may contribute to operational performance through improved cost efficiency, resource utilization, responsiveness, productivity, and process effectiveness (Akoth & Somba, 2023; Modak et al., 2023; Govindan et al., 2022). This interpretation is consistent with the Resource-Based View (RBV) and Natural Resource-Based View (NRBV), which emphasize the strategic value of organizational and environmentally oriented capabilities (Barney, 1991; Hart, 1995).

The framework also highlights the complementary role of Sustainable Supply Chain Initiatives (SSCI). Practices such as sustainable purchasing, green manufacturing, supplier collaboration, information sharing, and technological integration may support more effective reverse flows and resource recovery (Hsu et al., 2016; Yang et al., 2024). However, the potential operational benefits of SRL may be constrained by limited financial resources, inadequate technology, weak infrastructure, insufficient technical expertise, and poor organisational coordination (Dabees et al., 2023; Sun et al., 2022).

Overall, the study contributes by integrating specific SRL practices, SSCI, and operational performance within a combined RBV–NRBV perspective. Rather than presenting empirically verified relationships, the framework proposes theoretically grounded relationships that can guide future empirical testing in manufacturing firms.

ACKNOWLEDGMENT

The authors acknowledge the support given by Fakulti Pengurusan Teknologi dan Teknousahawanan, Universiti Teknikal Malaysia Melaka, for the financial support and facilities provided in completing this research. The authors would like to thank Centre of Technopreneurship Development (CTeD), UTeM for their direct and indirect contributions.

REFERENCES

1. Abbas, A., Luo, X., Shahzad, F., & Wattoo, M. U. (2023). Optimizing organizational performance in manufacturing: The role of IT capability, green supply chain integration, and green innovation. *Journal of Cleaner Production*, 423, 138848. <https://doi.org/10.1016/j.jclepro.2023.138848>.
2. Akoth, A., & Somba, S. M. (2023). Reverse logistics and performance of footwear manufacturing firms in Kenya. *International Journal of Social Science and Humanities Research*, 1(1), 784-795.
3. Alarcón, F., Cortés-Pellicer, P., Pérez-Perales, D., & Mengual-Recuerda, A. (2021a). A reference model of reverse logistics process for improving sustainability in the supply chain. *Sustainability*, 13(18), 10383.
4. Aryee, R. & Department of Marketing and Supply Chain Management, Methodist University College Ghana, Accra, Ghana. (2024). Theoretical perspectives in reverse logistics research. In *The International Journal of Logistics Management* (Vols. 35–35, Issue 6, pp. 1897–1920)
5. Banihashemi, T. A., Fei, J., Chen, P. S.-L., & National Centre for Ports and Shipping, Australian Maritime College, University of Tasmania, Launceston, Australia. (2019). Exploring the relationship between reverse logistics and sustainability performance: A literature review. In *Modern Supply Chain Research and Applications* (Vols. 1–1, pp. 2–27).
6. Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>.
7. Bian, Y., & Xiao, T. (2025). Returns management in a supply chain considering freight insurance and

- consumer disappointment aversion. *Transportation Research Part E Logistics and Transportation Review*, 195, 103975.
8. Dabees, A., Barakat, M., Elbarky, S. S., & Lisec, A. (2023). A Framework for Adopting a Sustainable Reverse Logistics Service Quality for reverse logistics Service Providers: A Systematic Literature Review. *Sustainability*, 15(3), 1755.
9. Duong, N. (2022). Relationship of social sustainability, operational performance and economic performance in sustainable supply chain management. *GLOBAL BUSINESS & FINANCE REVIEW*, 27(4), 47– 65.
10. Firdous, H., & Ramish, A. (2023). Reverse logistics inefficiencies: A multiple case study analysis of food supply chains from Pakistan and Malaysia. *Operations and Supply Chain Management*, 16(3), 365–377.
11. Govindan, K., Nosrati-Abarghoee, S., Nasiri, M. M., & Jolai, F. (2022). Green reverse logistics network design for medical waste management: A circular economy transition through case approach. *Journal of Environmental Management*, 322, 115888.
12. Habib, M. A., Bao, Y., & Ilmudeen, A. (2020). The impact of green entrepreneurial orientation, market orientation and green supply chain management practices on sustainable firm performance. *Cogent Business & Management*, 7(1), 1743616.
13. Hammad, F., Sattar, F. A., Ahmed, W., & Akram, M. A. (2025). Understanding the influence of strategic reverse logistics management on the sustainable performance of the organization.
14. Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, 20(4), 986–1014. <https://doi.org/10.5465/AMR.1995.9512280033>.
15. Hashemi, S. E. (2021). A fuzzy multi-objective optimization model for a sustainable reverse logistics network design of municipal waste-collecting considering the reduction of emissions. *Journal of Cleaner Production*, 318, 128577.
16. Hsu, C.-C., Tan, K.-C., & Zailani, S. H. M. (2016). Strategic orientations, sustainable supply chain initiatives, and reverse logistics: Empirical evidence from an emerging market. *International Journal of Operations & Production Management*, 36(1), 86–110. <https://doi.org/10.1108/IJOPM-06-2014-0252>.
17. Ishola, B. (2019). Handling Waste in Manufacturing: Encouraging Re-Manufacturing, Recycling and Re-Using in United States of America. *Procedia Manufacturing*, 39, 721–726
18. Jaakkola, E. (2020). Designing conceptual articles: Four approaches. *AMS Review*, 10, 18–26. <https://doi.org/10.1007/s13162-020-00161-0>
19. Kim, Jungmin; Manna, Apurba; Roy, Arindam; Moon, Ilkyeong (2023). Clustered vehicle routing problem for waste collection with smart operational management approaches. *International Transactions in Operational Research*.
20. Kumar, N., Brint, A., Shi, E., Upadhyay, A., & Ruan, X. (2019). Integrating sustainable supply chain practices with operational performance: An exploratory study of Chinese SMEs. *Production Planning & Control*, 30(5–6), 464–478. <https://doi.org/10.1080/09537287.2018.1501816>.
21. Lamba, P., Kaur, D. P., Raj, S., & Sorout, J. (2021). Recycling/reuse of plastic waste as construction material for sustainable development: a review. *Environmental Science and Pollution Research*, 29(57), 86156– 86179.
22. Lu, Z., Hasselström, L., Finnveden, G., & Johansson, N. (2022). Cost-benefit analysis of two possible deposit-refund systems for reuse and recycling of plastic packaging in Sweden. *Cleaner Waste Systems*, 3, 100048. <https://doi.org/10.1016/j.clwas.2022.100048>
23. Machiso, M. R., Kanyepe, J., & Tukuta, M. (2024). The reverse logistics practices and operational performance of firms in the manufacturing sector: A systematic review. *Transport & Logistics: The International Journal*, 24(56). <https://doi.org/10.46544/TNL.v24n56.02>.
24. Mangla, S. K., Kusi-Sarpong, S., Luthra, S., Bai, C., Jakhar, S. K., & Khan, S. A. (2020b). Operational excellence for improving sustainable supply chain performance. *Resources Conservation and Recycling*, 162, 105025.
25. Mbago, M., Ntayi, J. M., Mkansi, M., Namagembe, S., Tukamuhabwa, B. R., & Mwelu, N. (2025). Implementing reverse logistics practices in the supply chain: a case study analysis of recycling firms.
26. McDougall, N., Wagner, B., & MacBryde, J. (2021). Leveraging competitiveness from sustainable operations: frameworks to understand the dynamic capabilities needed to realise NRBV supply chain strategies. *Supply Chain Management an International Journal*, 27(1), 12–29.

27. Melo, A. C. S., Braga, A. E., Leite, C. D. P., Bastos, L. D. S. L., & De Lucena Nunes, D. R. (2020). Frameworks for reverse logistics and sustainable design integration under a sustainability perspective: a systematic literature review. *Research in Engineering Design*, 32(2), 225–243.
28. Melo, A. C. S., De Nunes, D. R. L., Júnior, A. E. B., De Lima, R. B., De Menezes Nascimento Nagata, V., & Martins, V. W. B. (2022). Analysis of activities that make up reverse logistics processes: proposition of a conceptual framework. *Brazilian Journal of Operations & Production Management*, 19(2).
29. Modak, N. M., Sinha, S., & Ghosh, D. K. (2023). A review on remanufacturing, reuse, and recycling in supply chain—Exploring the evolution of information technology over two decades. *International Journal of Information Management Data Insights*, 3(1), 100160.
30. Muhammad, A., 1,4, Naidu, B. M., 2, Kalliani Sundram, V. P., 1,3, The role of Logispreneurs in Advancing waste Management in Malaysia: towards a sustainable reverse logistics and green future. *Information Management and Business Review*, 15(3), 222–228.
31. Nanayakkara, P. R., Jayalath, M. M., Thibbotuwawa, A., & Perera, H. N. (2022). A circular reverse logistics framework for handling e-commerce returns. *Cleaner Logistics and Supply Chain*, 5, 100080.
32. Nayak, B., Bhattacharyya, S. S., & Krishnamoorthy, B. (2023). Integrating the dialectic perspectives of resource-based view and industrial organization 58 theory for competitive advantage – a review and research agenda. *Journal of Business & Industrial Marketing*, 38(3), 656–679.
33. Prajapati, H., Kant, R. and Shankar, R. (2022), “Exploring the reverse logistics frameworks: a systematic literature review”, *International Journal of Logistics Systems and Management*
34. Richnák, P., & Gubová, K. (2021). Green and reverse logistics in conditions of sustainable development in enterprises in Slovakia. *Sustainability*, 13(2), 581.
35. Saglam, Y. C. (2023). Analyzing sustainable reverse logistics capability and triple bottom line: the mediating role of sustainability culture. *Journal of Manufacturing Technology Management*, 34(7), 1162–1182.
36. Sapry, H. R. M. (2023). Modelling the Criteria for Product Returns in A Pharmaceutical Company. *International Journal of Industrial Engineering & Production Research*, 34(4), 1–19.
37. Schoder, D., Schlagwein, D., & Fischbach, K. (2019). Open Resource-Based View (ORBv): a theory of resource openness. In *Fortieth International Conference on Information Systems*, Munich 2019.
38. Shahparvari, S., Soleimani, H., Govindan, K., Bodaghi, B., Fard, M. T., & Jafari, H. (2021c). Closing the loop: Redesigning sustainable reverse logistics network in uncertain supply chains. *Computers & Industrial Engineering*, 157, 107093.
39. Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339. <https://doi.org/10.1016/j.jbusres.2019.07.039>
40. Suchek, N., Ferreira, J. J., & Fernandes, P. O. (2023). Industry 4.0 and global value chains: what implications for circular economy in SME? *Management Decision*, 62(9), 2915–2936.
41. Sun, X., Yu, H., & Solvang, W. D. (2022). Towards the smart and sustainable transformation of Reverse Logistics 4.0: A conceptualization and research agenda. *Environmental Science and Pollution Research*, 29, 69275–69293. <https://doi.org/10.1007/s11356-022-22473-3>.
42. Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Review*, 4(3), 356–367. <https://doi.org/10.1177/1534484305278283>
43. Trivellas, P., Malindretos, G., & Reklitis, P. (2020b). Implications of Green Logistics Management on Sustainable Business and Supply Chain Performance: Evidence from a Survey in the Greek Agri-Food Sector. *Sustainability*, 12(24), 10515.
44. Yang, K., Thoo, A. C., Ab Talib, M. S., & Huam, H. T. (2024). How reverse logistics and sustainable supply chain initiatives influence sustainability performance: The moderating role of organisational learning capability. *Journal of Manufacturing Technology Management*, 35(1), 141–163. <https://doi.org/10.1108/JMTM-04-2023-0143>
45. Yogi, K. S., Sindhu Abbidi, Vishweshwar Gupta Komaravelli, Ashfaq Ali Baig, Rasuri Pranav, KLH Global Business School, & Koneru Lakshmaiah Education Foundation, (Deemed to be University). (2023). Reverse Logistics Practices Cases Analysis using Text Analytics. In *Proceedings of the International Conference on Industrial Engineering and Operations Management [Conference proceedings]*.