Reverse Logistics As a Way To a Sustainable Transformation In Organizations: A Literature Review

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Abstract

Currently, the global growth of logistics costs and socio-environmental problems are upward trends. In line with this, reverse logistics is a tool with great potential, as it is a viable alternative to respond to this problem. In this sense, the present research work aims to analyze, compare, and interrelate the existing literature regarding reverse logistics as a solution to the problem posed. For this, a review of the concepts of supply chain, reverse logistics, costs, environmental impact, corporate social reputation, among other concepts was carried out. Then, through the methodology of the systematic review of the literature, the results obtained from the analysis of a universe of thirty papers will be displayed. After the analysis is carried out, the literature behavior and trends will be exposed through the classification of the studies in fourteen categories, with special emphasis on the main benefits found when applying reverse logistics in companies, the most recurrent being the following: socio-environmental, economic, and commercial benefits. These are observed in multiple types of companies, sectors, and geographical spaces. Among them, industrial-type companies stand out in the retail, electronics, and construction sectors in the geographical area of Asia. This showed that the application of reverse logistics is viable, being an ideal path for a sustainable transformation towards more efficient and environmentally friendly operations.

Keywords
Reverse logistics, supply chain, circular economy and sustainability.

1. Introduction
Supply chain and logistics are pivotal for any organization's operations. "Supply Chain Management" by Chopra and Meindl (2020) stresses the importance of achieving optimal profitability through effective service and market focus. These concepts also profoundly impact an organization's sustainability and operational strategies (Gechevski et al. 2016). Today, discussions about the environmental impact of logistics costs are on the rise. A recent environmental report has revealed a troubling increase in methane levels, a potent greenhouse gas. According to Statista's 2023 data, methane levels have risen by 12% from 1990 to 2023. In parallel, logistic costs are also escalating. A Statista chart (2022) demonstrates a 54% increase in US business logistics costs from 2005 to 2021. Amazon, an industry giant, experienced a remarkable 204% surge in fulfillment and shipping expenses from 2017 to 2021. This surge led to a

notable increase in these logistics costs as a proportion of their net sales, rising from 26.4% in 2017 to 32.3% in 2021 (Statista 2022).

Given these challenges, organizations must adapt to escalating costs and environmental concerns. There's an urgent need for transformative approaches to supply chain and logistics management, striving for increased efficiency and diminished environmental impact. The escalating socio-environmental impacts and rising logistics costs, coupled with society's growing environmental consciousness, underscore the necessity for change.

Considering this context, the research question emerges: Does existing literature and research demonstrate that implementing reverse logistics in organizations facilitates a sustainable transformation, leading to improved efficiencies, reduced costs, diminished socio-environmental impacts, and an enhanced reputation?

1.1 Objectives

The study's main objective is to analyze the literature that proves that reverse logistics is a solution to environment pollution and the rising logistics costs in companies' issues, comparing, interrelating, and identifying possible gaps or similarities between existing articles.
To achieve this, several secondary objectives were defined:

- Describe investigations that indicate that reverse logistics improves the logistics processes efficiency by focusing on efficient resource use. Achieving thus lower costs, decreasing pollution generation and a better reputation.
- Compare investigations that indicate that reverse logistics improves the logistics processes efficiency by focusing on efficient resource use. Achieving thus lower costs, decreasing pollution generation and a better reputation.
- Classify investigations that indicate that reverse logistics improves the logistics processes efficiency by focusing on efficient resource use. Achieving thus lower costs, decreasing pollution generation and a better reputation.

2. Literature Review

Research's concepts are based on 3 main groups: supply chain concepts, environmental sustainability, and reverse logistics.

2.1 Supply Chain

Firstly, "supply chain", is defined by Chopra and Meindl (2020) as "all parties involved, directly or indirectly, to satisfy a customer's request. The supply chain includes not only the manufacturer and suppliers, but also transporters, warehousemen, retailers (retailers), and even the customers themselves". Additionally, Gechevski et al. (2016), defined it as a work network composed of a chain of activities, facilities, people, among other resources, these are directly or indirectly involved in providing goods or services to customers.

Regarding the "logistics" concept, it consists of a group of activities, mainly the transport, storage and distribution of the various materials that flow along the chain. Materials are considered in their various forms: raw material, intermediate materials, and finished product, etc. Gechevski et al. (2016)

Then, "logistics administration" (LA) refers to the part of supply chain management (SCM) that plans, implements, and controls an effective and efficient flow of goods, services, and information between producer and consumer. (as cited in Tepprasit and Yuvanont 2015, pp. 259).

2.2 Environmental Sustainability

Environmental sustainability is another main topic that is necessary to understand correctly for the correct study's comprehension. Going deeper into detail, the first concept that stands out is "corporate social responsibility"; companies follow and abide by the organization's own regulations focused on this concept, but they must also comply with certain environmental policies, Gechevski et al. (2016) points out that it is essential to have permits, standards, audits, among other requirements to not be at fault (pp. 67). Lastly, another concept to address is "circular economy". It is defined as the reuse of inputs and materials from the supply chain, as indicated by Dias and Braga Junior (2017), the substitution of natural resources for recycled materials, the reduction of energy used for production and the

reduction of pollution entails to the reduction of waste dumps since they would be largely reused (as cited in Pagán 2017, pp. 154).

2.3 Reverse Logistics

Hazen (2011) points out the following about Reverse logistics (RL): "Reverse logistics is a logistics function focusing on the backward flow of products from customers to suppliers" (as referred by Banihashemi et al. 2019, Introduction, par. 2). Additionally, Gechevski et al. (2016), explain that RL is a process in which the producer systematically accepts products or part of them to give them a possible recycling, remanufacturing or to discard them (2016, pp. 65). Furthermore, Leite and Brito (2010) affirm that the RL is an area of business logistics, which plans, operates, and controls the flow of materials, information that returns from the chain. Finally, Banihashemi et al. (2019), describes four phases: product acquisition, collection, inspection and classification and arrangement (reuse, repair, remanufacturing, recycling, and disposal (as cited in Banihashemi et al. 2019, par 7).

RL aims to add value through recycling, remanufacturing, or responsible disposal. The benefits of RL increased revenue, corporate goodwill, cost reduction, and improved sustainability. It also emphasizes the close relationship between RL, green supply chain management, green logistics, and cost management in promoting responsible and sustainable operations.

3. Methods

A literature review consists of several phases. Bodolica and Spraggon (2018) limit this statement, explaining that the review process divides into three stages. The analysis begins with a superficial analysis of the information, exploring each time deeper into the topic until a very detailed examination of the articles is achieved (pp.5).

To reach this goal, this research will be divided into these three phases:

- Phase 1: Identification of articles, categories, and subcategories
- Phase 2: Findings
- Phase 3: Validation of results and discussion

3.1 Phase 1: Identification of articles, categories, and subcategories

The first step in a literature review is to identify the articles for the study. Machi and McEvoy (2016) highlight the importance of a clear strategy to collect and categorize information before the analysis (pp.5).

This procedure involves defining keywords and databases, scanning, quick reading, and mapping. Articles are verified, unfit ones discarded, and the process repeated until desired content is obtained.

The second sub-task to follow is the scan. Firstly, the information will be filtered using keywords and Boolean operators, these will allow obtaining the necessary information Bodolica and Spraggon (2018). Thus, a list of useful investigations will be obtained (Machi and McEvoy 2016, pp.65-71).

After identifying various papers, a quick reading follows. Machi and McEvoy (2016) suggest reviewing titles, subtitles, and key sections. Mapping comes next, involving categorizing data by ideas, authors, etc. This organizes concepts and validates the alignment from the filtered articles with the research's goals (pp.73-74). The Figure 1 describes the core ideas construction reached through mapping, the sub concepts the categories that are built through mapping, and the elements their detail.

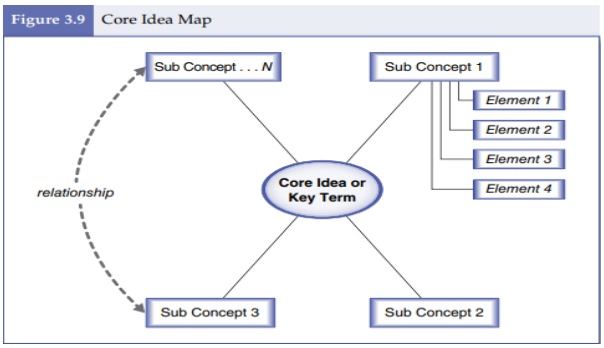

Figure 1. Research Mapping Example

In the next activity, the groups defined above will be used as a base. Machi and McEvoy (2016) suggest using this classification to organize research documents efficiently. This involves creating a format that includes properties such as author, publication date, study type, and subject, among other details (pp. 86-90).

The result of this process will be a matrix that will be used for establishing the categories and subcategories in which the studies will be grouped according to their common characteristics. This organization is crucial for the study since it simplifies the reading and understanding of the information. Van Wee and Banister (2016) explain that this activity will allow readers and researchers to make comparisons between different studies more easily. This process can be visually simplified by tables, graphs, and schematics (pp. 279).

Thus, using the auxiliary table, categories and subcategories are defined in three groups: scientific production, methodological strategy, and study topic. Hernández et al. (2016) guidelines guide the first two, while Machi and McEvoy (2016) method is used in the third. To visualize the identified categories and subcategories, a scheme like the one presented by Hernández et al. (2016) will be used, below there is an example (Figure 2): each main theme, have multiple subthemes.

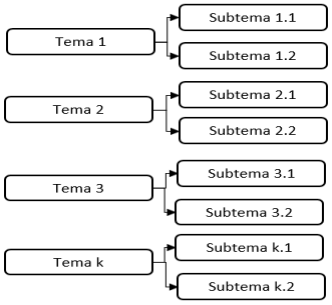

Figure 2. Example of categories and subcategories scheme

3.2 Phase 2: Findings

In this second phase, the first step involves analyzing the selected articles using the "Side-by-side Reasoning" technique from Machi and McEvoy (2016). This consists in using information from different articles to support a general claim, seeking to derive multiple conclusions from this technique. To do this, a convergence map is created that organizes the collected evidence and demonstrates the conclusions.

Secondly, these conclusions must be used to create an argument using Machi and McEvoy "Comparative Reasoning" technique. In this study, the claims will be grouped into different arguments and similarities and differences between them will be identified. This will serve as a guide for the construction of a final argument that describes the literature analyzed and highlights the findings. In this phase, statistical techniques are usually put in practice to analyze trends for the established groups and subgroups, is in this stage, that articles' trends are studied (Machi and McEvoy 2016,

pp. 109). Indicators such as the average and count of articles by category will be presented, following the approach of Hernández et al. (2016).

3.3 Phase 3: Results validation and debate

In this last phase, the research is validated by confirming the results of the categories and trends found in the article's analysis. To accomplish this task, three experts in logistics and academics were interviewed, using the triangulation technique to guarantee reliability and the interviews will be semi-structured. This type of interview facilitates the use of questions that seek direct answers but also allows the participants to share their points of view. The guide proposed by Hernández et al. (2016) is followed to formulate questions, resulting in a combination of open and closed questions to obtain reliable data and diverse perspectives.

4. Data Collection

For the data collection, several databases were used: Scopus, Ebsco, Proquest, Web of Science, Dialnet and Google Scholar. To collect the data the following keywords were used: “logística”, “logística inversa”, "economía circular", "reverse logistics", "circular economy" and "green supply chain management". Below, a scheme (Figure 3) that reflects the data collection process followed previously described in Methods chapter will be displayed.

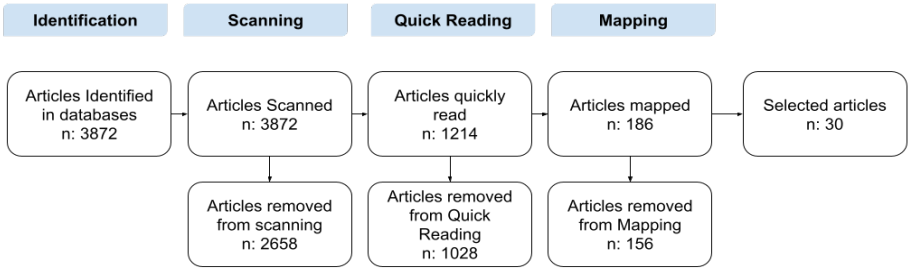

Figure 3. Example of categories and subcategories scheme

These thirty articles were analyzed and classified in the three mentioned categories. To accomplish this task a matrix with the following information was built in Microsoft Excel: Article Name, Authors, Journal, Number of Authors, Number of Citations, Publication Date, Geographical Location, Number of References, Study Type, Study Scope, Study Approach, Reverse Logistics Type, Benefits, Company Type, Industry Sector and Material Type.

5. Results and Discussion

With the methodology described in the first chapters, multiple findings were reached and put in practice in order to achieve a deep literature analysis. The data discovered from the reviewed literature will be described in the following lines with the support of the categories and subcategories previously identified. The next categories and subcategories were defined:

- Scientific Production: Number of authors, Publication Date, Geographical Location, Number of quotations, Number of References, Publication Journal
- Methodological Strategy: Study Type, Approach, Scope
- Study Topic: Reverse Logistics Type, Benefits, Company Type, Industry Sector, Material Type

5.1 Numerical Results

5.1.1 Scientific Production

5.1.1.1 Number of Authors

Three groups were identified: single authors which consisted of two papers, two to three authors composed of sixteen papers and four or more authors which contained twelve papers.

In relation to the geography subcategory, single-author papers are in America and Asia, the most recurrent regions. These papers are mainly case studies that were developed in the general industry and agriculture sectors. This last

group is one of the least frequent with just one study. On the other hand, the second and third group have a different reality, as those are groups with several and diverse studies.

5.1.1.2 Number of Quotations

In relation to studies with more than ten quotations, a notable finding stands out. When comparing sectors based on their quotation numbers, it seems that studies with more than ten citations build together a significant portion: 71% for "General Industry," 100% for Retail, 67% for construction, and 100% for electronics. This collectively accounts for 73.68% of studies with more than ten quotations, underscoring the significance of using RL in these key sectors to improve socio-environmental performance and minimize logistical costs.

5.1.1.3 Number of references

For this subcategory, three subgroups were used: less than twenty-five, between twenty-six and fifty, and more than fifty references. Seven (23%) have less than twenty-five references, nine (30%) between twenty-six and fifty, and 14 (47%) more than fifty references. Thus, most of the papers used for research have a considerable amount of evidence. For this reason, the information collected has the scientific support required for the validity and certainty of the findings of the study.

5.1.1.4 Publication Journals

The journals with the most relevant publications are "Sustainability" which contributed six papers and "Waste Management and Research" from which two studies were obtained. These journals tend to feature papers from Europe, while Asia papers are more spread across various journals. The research in these journals follows a unique pattern: while most analyzed papers are from these journals, these have a limited representation in the Asian continent; this area contains most of the papers that were selected. However, only two out of eight papers are included. Interestingly, studies from this region spread across various other journals on the list. Meanwhile, the more common journals primarily feature European papers, making up 67% of the total.

5.2 Graphical Results

This section's objective is to visually represent the primary research categories for a clearer understanding of the analyzed information-

5.2.1 Scientific Production

5.2.1.1 Publication Date

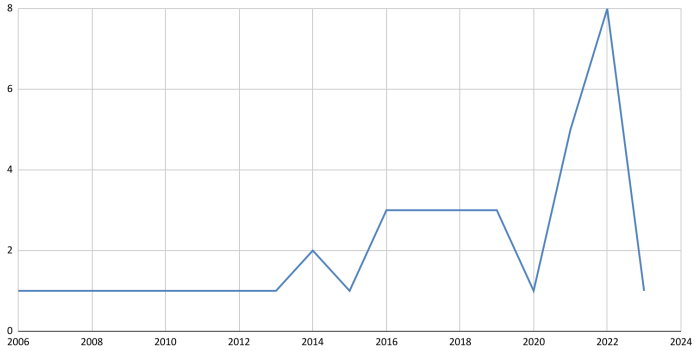

Figure 4. Publication Date

The first subcategory to be addressed is "Publication Date". In the figure 4 it stands out that over the years the number of studies grew rapidly, confirming the relevance that RL has acquired as a topic. Curiously, most of the papers are from the same decade, indicating a focus on actualized information. It appears that the paper's age is linked to its citation count as the older the paper, the more citations it tends to have. Among the few articles published between 2000 and 2010, one stands out with 170 citations (Janse et al. 2009).

5.2.1.2 Geographical location

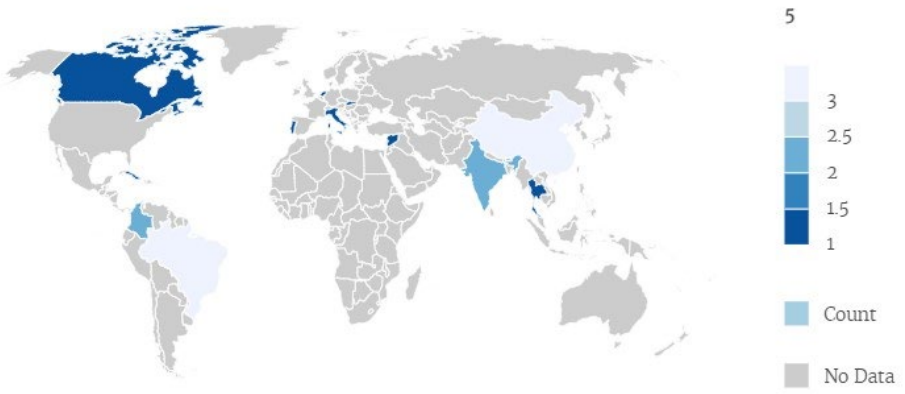

Figure 5. Geographical Location

Then, concerning the geographical location, the following groups were used: Europe, Africa, America, Asia and Global (papers lacking a specific geographical location). As the Figure 5 shows, the largest number of papers come from Asia with 30%, followed by America with 23%. For this reason, a large part of the studies referring to RL and its economic and socio-environmental benefits have been developed in these areas. Worldwide focused studies sum up the 33% of the studies. Some of these papers studies a specific continent or geographic space such as European nations, another group consists of literature reviews that studies RL as a global topic.

5.2.2 Methodological Strategy
5.2.2.1 Study type

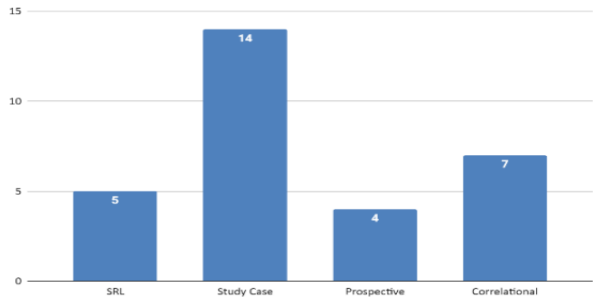

Figure 6. Study Type

Here, four types of studies were identified, this are shown in Figure 6: Case studies, with 50% followed by correlational study with 23% and finally, SLR and prospective with 17% and 10% respectively. Out of the thirty papers, twenty-five are qualitative or mixed, the other five are quantitative. Although a prospective or a review of the literature is usually qualitative research, some of these uses numerical-statistical analysis to reach conclusions, becoming mixed research.

5.2.2.2 Approach

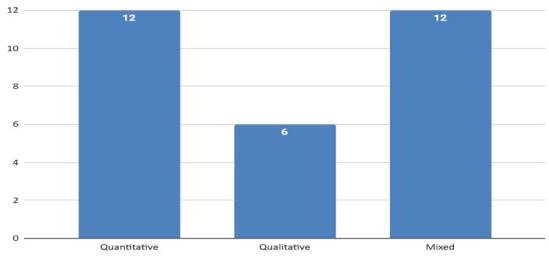

Figure 7. Approach

Figure 7 reflects clearly that variables are equally distributed in different approaches, mixed and quantitative methods each compose 40% of the total. On the other hand, qualitative papers make up less than 20%. Notably, 75% of the quantitative papers have an exploratory scope, this trend stays for mixed-method papers as well. This reinforces the author's intentions beyond academic contributions, emphasizing practical implementation of RL to attend real-world benefits.

5.2.2.3 Scope

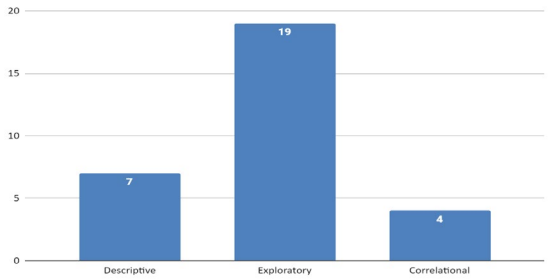

Figure 8. Scope

Continuing with research scope, this subcategory reveals that exploratory studies are the most prevalent (63%), as its visible in Figure 8; followed by descriptive (23%) and correlational (13%) approaches. Among the exploratory studies, 53% have a mixed method, while 47% opt for a quantitative approach. Notably, quantitative research aims to measure the impact of RL, displaying mathematical and statistical methods to demonstrate its benefits.

5.2.3 Study Topic
5.2.3.1 Reverse logistics type

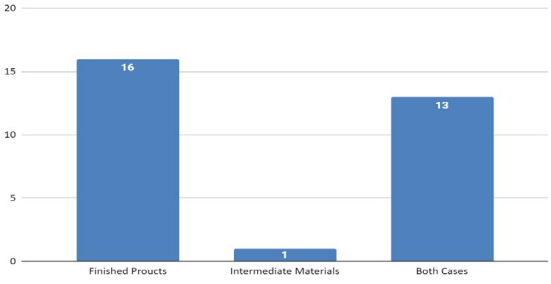

Figure 9. Reverse Logistics Type

Regarding RL type, Figure 9 displays three possible cases: investigations focused on reverse logistics (RL) of finished products, studies that examine the retrieval of materials generated during the production process (intermediate materials), and papers that encompass RL comprehensively (both finished products and intermediates). The percentage breakdown between these groups is as follows: 53% of papers concentrate on RL of finished products, 43% on both types of RL, and 3% are concerned with RL of intermediate products. Regarding the state of the art, the percentages vary slightly: 41% for RL of finished products and 58% for general RL. This is since most papers identified in the state of the art follow a similar approach to this study, examining RL from a comprehensive standpoint without delving into specific activities or processes. In conclusion, studies on RL of finished products are currently predominant. However, studies involving intermediate materials are also present, albeit not exclusively focused on them, often including the recovery of finished products. Conversely, research exclusively centered on RL of intermediate materials is limited. The prevailing trend involves applying RL to finished products at the end of the production chain, with the possibility of material recovery throughout the process (RL of intermediate materials).

5.2.3.2 Benefits

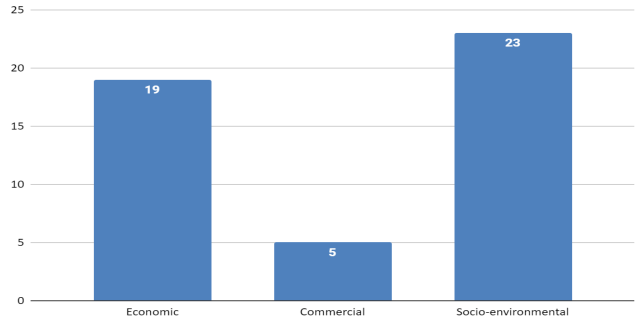

Figure 10. Benefits

Benefits is one of the main topics discussed when covering RL studies. Figure 10 shows that when applying RL socio-environmental benefits are usually prevalent, found in twenty-three out of the thirty cases. Additionally, economic benefits are present in nineteen cases, while commercial benefits occur in five cases. When correlating the attained benefits with the type of company, it becomes apparent that industrial companies primarily experience socio-environmental benefits. Out of the fourteen industrial companies, 80% gain benefits from this nature, and economic benefits are achieved in 64%. Given that industrial companies typically deal with larger volumes of materials encompassing both finished and intermediate products, there are increased opportunities to implement reverse logistics throughout the entire supply chain.

5.2.3.3 Company type

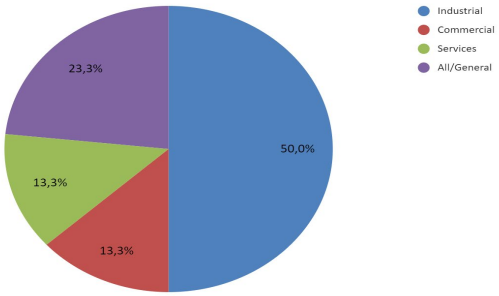

Figure 11. Company Type

This subcategory encompasses four groups: Services, Commercial, All (RL applied to companies regardless of the economic activity), and Industrial. As evident from the graph displayed above (Figure 11), industrial companies are predominant at 50%, followed by All (23%), services (13%), and commercial (13%). This distribution is meaningful as reverse logistics involves the return of materials across various sectors. Regarding RL type, among the fifteen cases focusing on finished products, 56% are attributed to industrial companies. This aligns with reality, as final stages of production chains in such companies often yield the greatest benefits in terms of RL.

5.2.3.4 Industry sector

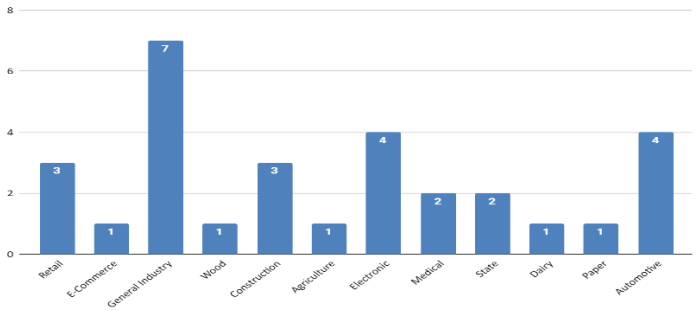

Figure 12. Sector

Another aspect to consider in this review is the sector in which the companies mentioned in the study operate. Figure 12 showed the twelve sectors considered in this research: retail, general industry, construction, electronics, medical, courier, public sector, plastics, dairy, paper, automotive, and Oil and Gas. The largest category is general industry, accounting for 23%, followed by electronics at 13.%. The automotive sector, construction and retail sectors share the third place with 10% each. Among these top sectors, a significant portion of the papers focus on the Asian continent, comprising 42% of the total. Europe follows with 24%, while the Americas account for 19% of the studies. In summary, these continents have a higher concentration of studies related to Reinforcement Learning and its advantages. Notably, these studies emphasize the application of RL in the top categories mentioned above.

5.2.3.5 Material type

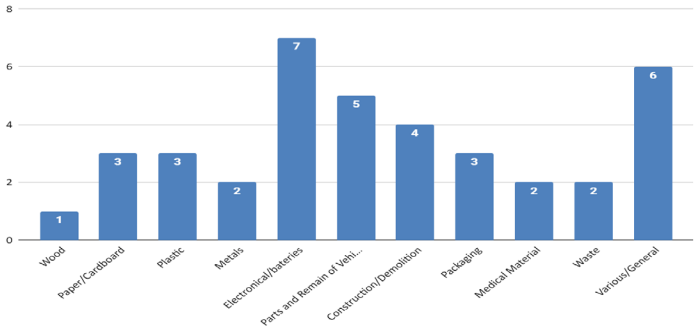

Figure 13. Material Type

In the mentioned subcategory, the graph above, shows that the most used materials for applying RL in various industries are Wood/Cardboard, Paper, Plastic, Metals, Electronics/Batteries, Vehicle Parts and Remains, Construction/Demolition, Packaging, Medical Material, Waste, and Miscellaneous/General. The data indicates that Electronics/Battery materials are the most frequent, accounting for 18% of occurrences. Other notable materials are miscellaneous (16%), vehicle parts (13%), and construction/demolition materials (11%). Upon closer analysis, it's clear that the Electronics/Batteries category is dominated by studies in the electronics sector, with four out of seven

papers focused on this area. Similarly, for materials related to Vehicle Parts and Remains, 80% of the papers are from industrial companies. This underscores the significant involvement of industrial sectors in these studies.

5.3 Papers results

The reviewed papers had positive results proving that RL is a useful tool that enables and helps organizations reach sustainable operations.

Some scholars developed RL models for different industries through mathematical methods such as fuzzy models or petri nets to design a RL process. Huang et al. (2022) proved RL as an effective alternative to manage demolition waste in the construction industry designing a model that helps to reduce carbon dioxide emissions by 0.0259 tons through an effective RL transportation management system. Vega de la Cruz et al. (2017) also had reassuring results, improving an ice cream production process productivity by 35.5% and the ice cream business profit by 98%. The automotive industry is another sector in which the RL model was successfully designed; Wenzun and Luo (2022) developed a waste electric vehicle battery RL process achieving a reduction in the production of batteries by 40%. P. Richnák and K. Gubová (2021) on their study in Slovakia shows that environmental policies are practiced by 47.3% of large enterprises. Hao et al. (2021) talks about the design of the RL network for Electric Vehicle Batteries (EVBs), considering recall risks. It combines predictive techniques and mathematical models to address safety, environmental concerns, social responsibility, and economic benefits. The research enhances planning and management of EVB retirement through a balanced approach to these factors. It provides potential solutions for maintaining this balance in various recall scenarios, offering guidance to decision-makers.

Pagán et al. (2017) presented the importance of applying RL in supermarkets in São Paulo, with a focus on plastic and cardboard. In six months of study, supermarkets reach a benefit of fifty thousand kg of abiotic material and twenty thousand kg of biotic material, leading to economic benefits. Post sale service is a process in which RL can be easily applied enabling immediate benefits, Mishra and Singh (2022) designed a reverse logistics network for post-sale service allowing to repair or remanufacture 100% of the returned products.

Some research had a different focus aiming to diagnose RL implementation status in a determined industry and location. Richnák and Gubová (2021) that 48.9% of the studies companies had RL successfully implemented obtaining a better environmental performance, mainly automotive enterprises.

A particular article consisted in proposing blockchain technology as a traceability scheme to ensure the correct development of RL processes Wu (2022). The model was successfully developed achieving only a 5% chance of the chain to be broken, thus optimizing the RL process by improving the materials traceability.

Other practitioners studied RL in a holistic way. Banihashemi et al. (2019) explored the relation between RL and sustainability performance in a Systematic Literature Review finding out that most of the studies pointed out that RL improved economic and environmental performance.

Hong et al. (2021) uncovered a strong link between reverse logistics, corporate image, social impact, and the medical devices industry, impacting consumers' views of suppliers and brand loyalty. They used a mathematical model and a real-world case study on the COVID-19 outbreak in Wuhan to estimate medical waste generation. Lingo 18.0 optimized the model based on real data and assumptions at the time, leading to four policy recommendations for better decision-making in designing reverse logistics for medical waste management during epidemic outbreaks (Yu et al., 2020).

5.4 Discussion

The purpose of this research is to address environmental issues and the ongoing increase in logistics costs within companies. The goal is to understand the current state of Reverse Logistics (RL) on a global level, including the sectors of application, types of materials, geographical locations, types of companies, among other aspects. To achieve this, the methodology employed is based on a SLR, which facilitates understanding of the existing knowledge about the subject (Machi and McEvoy 2016).

This study will serve as a foundation for future practitioners and researchers seeking to validate the benefits of implementing RL in companies, specifically in terms of costs and socio-environmental impacts. The obtained results support this statement, demonstrating that out of the thirty reviewed articles, twenty-three present socio-environmental

benefits, nineteen exhibit economic benefits, and five show commercial benefits of RL. Various sectors were addressed such as retail, electronics, and automotive, across different geographical regions. Additionally, the most treated materials in RL are highlighted, especially paper/cardboard, electronics/batteries, plastic, packaging, and construction/demolition waste.

In summary, the primary benefits identified when implementing RL in organizations are environmental, closely followed by economic advantages, and to a lesser extent, commercial benefits. These benefits are evident mainly in sectors such as electronics, construction, paper, retail, and plastic, primarily in Asia and Oceania. Furthermore, the results also indicate that even service sector industries can also benefit from implementing RL. These outcomes support an important statement; RL has utility and adaptability in diverse and complex contexts.

Moreover, these findings can be useful for organizations or entrepreneurs who desire to implement RL in their operations, offering them a strong foundation. When comparing the study with comparable systematic reviews, it stands out that the present study focuses on the benefits and types of companies related to RL.

5.5 Validation

To validate the findings', semi-structured interviews were conducted with three RL experts.

Firstly, each of them agreed with the statement that RL is a useful tool for minimizing waste generated by companies and mitigating environmental pollution. Regarding the categorization of existing literature on RL, the interviewees concurred that the study explains the essentials of RL and its benefits in an easy, comprehensive, and accurate way. However, they suggested adding a subcategory for the type of RL process, technique, or practice. Overall, the participants considered the research beneficial and well-displayed. In addition, they noted that it correctly covers what RL is, the benefits of its application, and the fields in which it can be implemented or applied.

6. Conclusion

This study examines how RL improves logistical efficiency by optimizing resources management to reduce costs, pollution, and enhance corporate reputation in the face of rising environmental challenges and global logistics expenses.

We conducted a thorough three-step research process: analyzing thirty articles, comparing, and categorizing them for a comprehensive overview of reverse logistics benefits, identifying relevant advantages when applying RL in diverse countries and industries, and conducting a precise literature classification.

To expand knowledge on this tool, we encourage focused studies and investigations on the reverse logistics process. Over time, as the field evolves, we expect more research to emerge. Additionally, exploring future literature on reverse logistics applications in Oceania and Africa can increase its visibility on corporate agendas.

In conclusion, reverse logistics plays a vital role in optimizing resources and reducing environmental impact, offering a reliable solution to address environmental challenges and escalating logistics costs, supported by numerous successful case studies.

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