A Framework for Adopting a Sustainable Reverse Logistics Service Quality for Reverse Logistics Service Providers: A Systematic Literature Review

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Abstract: Reverse logistics has become a competitive need for sustainability. Lack of resources to apply reverse logistics solutions has severely impacted many supply chains' costs and customer service, making it impossible to meet the expectations of return processing. In those conditions, client demands for higher service quality are the main drivers of effective sustainability operations. This study aims to establish the sustainable reverse logistics service quality (SRLSQ) theoretical framework offered by reverse logistics services providers (RLSPs). The study conducts a systematic methodology protocol by examining reliable academic periodicals using PRISMA guidelines based on the research scope and identified 56 papers from 2011–2022, with the main research focus on SSQ and RLSQ dimensions to develop a research framework. By re-evaluating those factors using the SRLSQ framework and by including sustainability into the service quality approach, this study expanded the practicability of reverse logistic service quality and sustainable service quality. The results point to a knowledge gap when it comes to quantifying the impact of reverse logistics operation process through a triple bottom line approach on customer outcomes, relationship quality (RQ), and mediation of operation risk factor, which could be examined within various contexts in subsequent work.

Keywords: sustainability; reverse logistics; sustainable reverse logistics service quality; customer satisfaction; operational risk

1. Introduction

Due to pressure from legislation and environment challenges, businesses have been urged to pay greater attention to reverse logistics (RL) activities [1]. Reverse logistics is a term that refers to the concepts of reducing, reusing, remanufacturing, and recycling when describing the handling of returned products. It refers to the product packaging and waste minimization in production [2]. The concept of "reusability" refers to returning any unneeded product to the manufacturer so that it can be used. The phrase "remanufacture" describes the process of repairing, restoring, or reworking items in order to extend their useful life. Recycling is the process of returning from the customer to the producer considering product value [3], as they allow organizations to enhance their financial performance while preserving the surrounding environment [4]. Since governments and customers are becoming more conscious of environmental preservation and sustainability [5], RL has developed into a crucial part of any successful and efficient supply chain, as it enhances global value chains for better supply chain sustainability [6]. RL helps in recapturing value from used or returned products, which reduces cost and waste [7]. In return, this enhances value for the customer and increases customer satisfaction and loyalty [8].

In the present day, sustainability initiatives in developing countries face challenges due to a lack of qualified personnel in RL, environmental awareness, and legislation

comprehension [9]. Due to the emergence of new climate patterns, businesses and organizations are increasingly concerned about environmental sustainability [10]. Sustainable logistics focuses on embedding sustainability in all logistics activities, such as procurement, transport, and reverse logistics [11]. Expanding economic integration and industrial development sites substantially escalate the need for ecologically sustainable practices [5]. Presently, emphasis is primarily on minimizing social costs and enhancing supply chain performance [12]. The key focuses of sustainable development are maintaining high environmental standards, protecting natural reserves, making optimal use of natural resources, as well as removing environmental constraints. In order to prevent having a harmful impact on the environment, businesses must manage it responsibly [13,14].

The most recent studies have addressed the economic and environmental benefits of RL; on the other hand, there is a deficiency of research examining how RL operations might enhance sustainability performance [15] by combining the triple bottom line of sustainability performance. Despite focusing on RL activities, such as repairing and replacing damaged products, RL may play a vital role in ensuring customer satisfaction and preserving their commitment [16]. Additionally, through customer feedback, RL can eventually help in developing the product design, as it helps organizations understand the reason for product return [17].

According to the literature review, there is currently no appropriate index approach to evaluate reverse logistics service processes for returned products that can effectively measure reverse logistics service quality (RLSQ) [18]. The analysis of the literature demonstrates that a few studies discussed Reverse Logistics Service Quality (RLSQ) [19,20]); however, in relation to sustainable service quality, these relationships have not been discussed in a systematic way. In addition, the most recent studies have addressed the economic and environmental benefits of RL; on the other hand, there is a deficiency of research examining how RL operations might enhance sustainability and quality of services [15] by combining the triple bottom line of sustainability performance.

Therefore, the implications of this study lie in revealing a knowledge gap by addressing the relationship of sustainable reverse logistics service quality through the triple bottom line approach on customer outcomes and relationship quality (RQ). In addition, it proposes employing operational risk as an important mediator variable to avoid any delay or inefficacy in implementation and customer satisfaction.

Since the Egyptian market suffers from limited implementation of reverse logistics service and its sustainability, in practical terms, this study highlights the significance of reverse logistics service quality and its sustainability for decision-makers and stakeholders due to its impact on customer satisfaction.

The paper is structured as follows: the literature review is presented, followed by the research methods. Then, the results and discussion are illustrated, and finally, the research conclusion is presented, which includes research contribution, limitations, and recommendation for future research. Section 4 discusses the findings related to reverse logistics services quality based on a sample of many case studies that cover various perspectives of sustainable service quality. Section 5 presents and discusses the conceptual framework and includes some propositions and managerial implications of the findings. Section 6 concludes the study by providing a brief discussion of the study's limitations and future research directions.

2. Literature Review

In this study, we employed two main theories, "sustainable service quality theory" and reverse "logistics service quality theory", to formulate a modified factor by combining the two theories and investigating the impact on customer perception and relationship quality. According to the literature reviewed, 56 papers between 2011 and 2022 have shown main factors that affect reverse logistics practices and perceived service quality in the presence of sustainable initiatives, as the authors will illustrate in next sections [21].

2.1. Sustainability Performance

Due to increasing environmental concerns in response to society's growing needs about environmental degradation, resource depletion, and climate change, businesses must adopt more environmentally friendly practices [22]. Recent research has demonstrated that a greater emphasis on and investment in businesses sustainability practices will not only assist them in establishing a socially responsible image but also enhance their overall sustainable performance in economic and environmental dimensions [23]. Due to diverse client expectations, severe environmental regulations and global competitors' market rivalry are becoming increasingly fierce in the present day. Logistics performance is one of the most critical criteria for organizations not only to survive but to prosper in today's competitive industry. Increasing expansion of the global economy, resource issues, as well as their relevance to the environment, have become a significant barrier to a long-term economic growth. The European Union (EU) and the international community face the problem of resolving the challenges of both economic expansion and excessive energy use, in addition to ecological damage [24]. Therefore, the literature on achieving sustainability emphasizes the transformation processes with several dimensions (technological, institutional, political, and economic) to encourage more environmentally responsible manufacturing and consumption [25]. A recent study discovered that one-third of respondents have no green initiatives or have initiatives with low maturity, which indicates that companies' current lack of defined sustainability agendas. [26].

Expanding global integration and industrialization place substantial pressures on sustainable and environmentally friendly practices. Currently, the emphasis is mostly on minimizing the negative effect and enhancing the appraisal of the supply and demand chain, as shown in Figure 1.
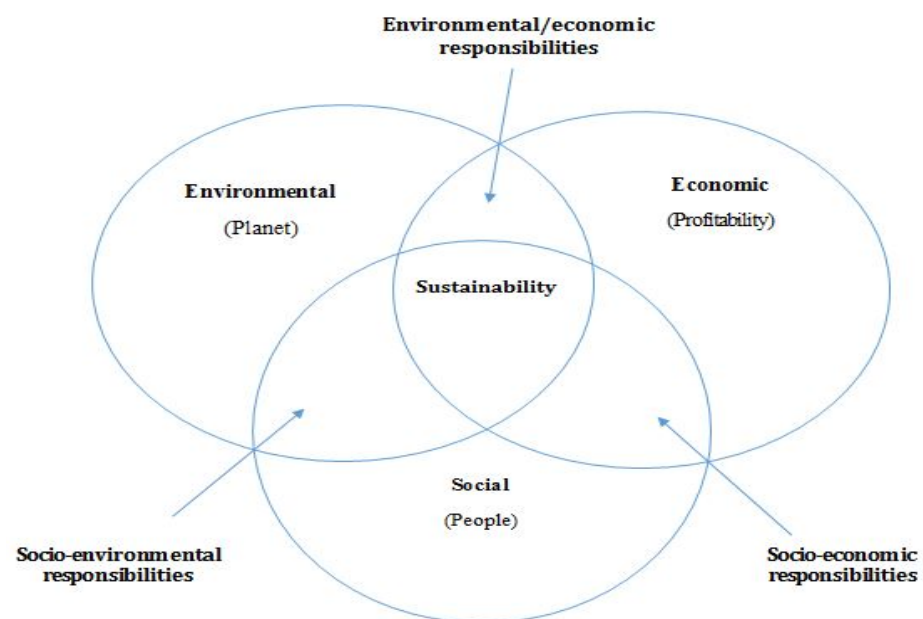

Figure 1. The three aspects of sustainability [4].

According to Trivellas et al. [27], logistical responsibilities are interdependent, and sacrifices are necessary in every aspect of sustainability. A system of reusable packaging is an example of dependency since it promotes resource efficiency, resulting in cost reserve; moreover, it generates more RL routes, and as a result, more emissions from transit. The objective of green logistics is to give fundamental justifications to convince stakeholders to accept environmentally conscious and logistics efforts [28]. To ensure environmentally sustainable logistics, companies must establish a performance management system for environmentally sustainable logistics [29]. In the context of sustainable logistics, Kaur et al. [30] highlighted greenhouse gases which are emitted from the acquisition of

raw materials through the delivery of the final product. The writers underline the importance of establishing a green responsibility for the supply chain. According to the study conducted by Naureen, 2020, the technical and behavioral practices in sustainable quality management are defined [10].

2.2. Sustainability Performance and Reverse Logistics Services

Many studies show that supply chain return management is implemented through reverse logistics, and the flow of resources and goods in the opposite direction of the chain is essential for a variety of reasons. Accordingly, environmental resources should be considered as an aspect to preserve the social dimension, to ensure safety elements through product recycling and disposal, and to control waste as part of the economic dimension [31]. Due to the significance of reverse logistic RL, businesses must develop in a sustainable way [32]. RL encompasses all of the following three pillars: (1) as an economic factor—cost reduction promotes sustainability, (2) as an environmental component—preserve the environment through disposal, recycling, and other operations, and (3) as a social component—preserve the ecological environment [33]. Equally important, RL is becoming an essential approach for manufacturing organizations in the present day [34]. Due to the complexity of reverse logistics operations, however, this strategy requires a professional support staff, including design and planning experts for a robust network, as well as repair and maintenance specialists to maintain the network operational [21]. As a result, the majority of manufacturers prefer to outsource their reverse logistics operations to professional service providers [35], which is cost-effective for them [36].

Reverse logistics is crucial because it contributes to the improvement of the organization's objectives, such as increasing customer satisfaction, decreasing resource investment levels, enhancing customer service, recovering assets, comprehending the reasons for hardware returns, reducing inventory, reducing repair costs, and minimizing distribution costs [36]. Much of the idea of utilizing reverse logistics in enterprises has good implications for the environment, such as reducing waste, reducing product costs, etc. Implementing RL in supply chains has a significant impact on the organization's performance.

2.3. Reverse Logistics Performance and Service Quality

Rapid increases in global markets proved to be problematic for companies dealing with returns due to the complexity of product retrieval services and the challenges of controlling reverse supply chains; therefore, reverse logistics (RL) services are becoming increasingly more important in today's corporate competitiveness due to their ability in managing materials and waste. Performing RL services in a good manner can restore the value of returns without sacrificing customer experience [37].

Therefore, effectiveness of RL services could protect the value and utility of materials for as long as conceivable, resulting in considerable profitability for the product life cycle [38]. Performing reverse logistics services can decrease overall waste in addition to helping businesses generate a profit, which is a major competitive advantage. There are a variety of reasons why professionals and scientists are becoming more interested in RL, considering the increasing environmental concerns, competitive advantage, financial potential, legal factors, and social responsibility. The elements of supply chain sustainability are associated with RL [17]. The fundamental requirements for competing in the global world market are the creation of a sustainable supply chain and the sustainability of the firm itself [39]. Many RL practices are related directly to companies' sustainability [1,8]. As a result, RL must be considered apart from sustainability logistics, as reverse logistics is not a component of sustainable performance but does play a key part in decreasing a company's harmful effects on ecology and the environment [40]. Unlike the supply chain, which begins with consumers and ends with the point manufacture [41], the user might be considered a key player in RL. As a result, RL must be developed according to user expectations, or the existing customer relationship must be optimized. Service quality can be increased through improving services [15]. Service quality aims not only to meet but to exceed expectations of

the consumer's perception. Moreover, this will fulfill the requirements of the stakeholders who are crucial to the organization, such as the general public, regulatory agencies, and suppliers. Customer satisfaction, which is critical to RL, must be examined in order to regulate quality [42]. If the degree of quality is low, it is because the expectations are greater than the performance assessment. Quality is the distinction between performance objectives and evaluations [43]. SERVQUAL-based methodology was presented to assess the disparities as well as to improve the consumer experience and demand for logistics service excellence supplied via companies in Malaysia [44]. SERVQUAL was used to assess the quality of services for major pharmaceutical suppliers in the Indian market. Moreover, it demonstrates how the quality of services influences consumer satisfaction. Those articles further demonstrated SERVQUAL model's efficiency in measuring the quality of logistics services. As a result, it was determined that in this study, an examination of a real case sample will be conducted to apply qualitative methodology for assessing the quality of RL services [45]. In order to maintain quality in RL, it is essential to enhance consumer perception, and of equal importance is the foundation of reverse logistics services [46].

3. Materials and Methods

We conducted a systematic research review, where we gathered and examined the literature evaluating the topic of reverse logistics, service quality, and sustainability performance. The research was conducted using a compilation of diverse scientifically published publications that are accessible through various databases. This pertains to the methodological strategy. The study utilizes a process for review given by Tranfield [47]. The study opted to broaden the search terms to encompass all of the many theories and approaches of both reverse logistics service quality (RLSQ) and sustainable service quality (SSQ) and Figure 2 illustrates the PRISMA inclusion procedure flow [48].
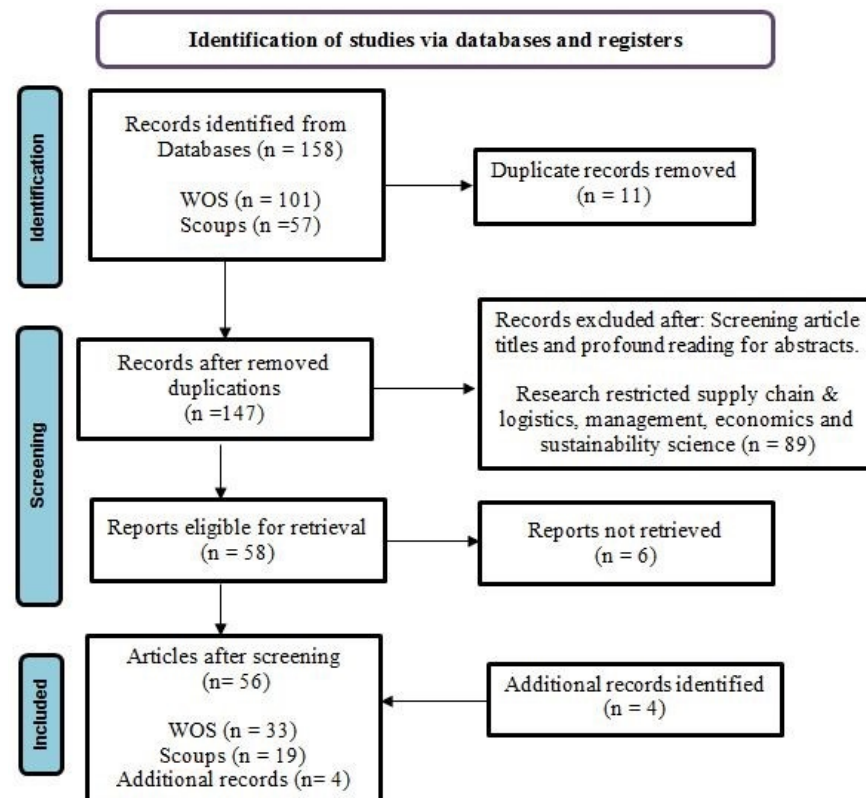

Figure 2. PRISMA 2020 flow diagram of the systematic literature review. Source: Adapted by the authors.

This methodology permits researchers to gather the required data via acquiring, comparing, and evaluating numerous sources by an objective method. This strategy generates transparent, trustworthy evidence and knowledge acquisition. This technique is direct, systematic, and reproducible. Utilized to identify, research, and report the current literature, the review methodology is divided into five major phases: (1) Literature works selection timeline, (2) Extracting and synthesizing the selected resources, (3) Grouping research independent variables, (4) Data analysis, and (5) Reporting the results and employing them, as shown in Table 1.

Table 1. Refinement of literature study.

Step No.	Step	Classification	Number of Articles
Step 1	Proposing the research questions	The CIMO identified the performance of the reverse logistics domains (C), sustainable reverse logistics assessment methods (I), service quality indicators, tools (M), performance, efficiency, and both positive and negative impacts on reverse logistics service quality and sustainability as the main characteristics of the study (O).	
Step 2	Locating studies	The database will be filtered using the following terms: reverse logistics, 3PRLP, sustainability, service quality indicators, and customer satisfaction result. In databases, such as WOS, Scopus, and Science Direct, the study string can be found in the title, summary, or article phrases. Duration of the search: 2011–2022. In English language for scholarly journals.	147
Step 3	Study selection and evaluation	A comprehensive screening of the citation's abstract from those chosen in the second phase, followed by the selection of those that are most related to the current research question.	89
Steps 4 and 5	Results, Analysis, and Discussion	A comprehensive examination of the selected papers through introduction, methodology, and conclusion. Criteria for inclusion: articles addressing reverse logistics merged with service quality and the sustainability criteria: extraction and removal of irrelevant and duplicated papers.	56

The review in this study takes advantage of the methodological frameworks and contributions that earlier scholars in this field have established. In order to close the current gap in the evaluation of sustainable reverse logistics service quality (SRLSQ), the analysis' conclusion will provide a thorough summary of the key determining works in the literature and reveal a systematic collection of definitions and knowledge that would otherwise be spread among a variety of research. On the basis of the gap, the researchers addressed the following questions:

RQ1: What are the sustainable service quality dimensions and indicators?

RQ2: How will sustainable service quality performance impact the reverse logistics service recovery process?

RQ3: Which study gap and problems can be identified for future research initiative?

The keyword structure that is provided and the preceding literature review research are used to iteratively choose the structured keywords. The following search term is then used to query the same electronic databases. On the basis of the research objectives and important topics, the initial search strings include the following keywords: "reverse logistics" AND "sustainability" AND "3PRLP" AND "service quality indicators" AND "customer satisfaction". The advanced search also uses Boolean logic, connecting the two key terms with "AND," and accepting synonyms with "OR."

The Scopus database (Elsevier) is utilized for the majority of online searches, along with other electronic international journal databases, such as Emerald Insight, Web of Science, and Science Direct. The relevant articles are chosen and filtered using the following five stages:

Step 1: Formulation of the research questions: the CIMO method was deployed according to the research context of business management and organization; therefore, the research question was established accordingly.

Step 2: Locating studies: answering the research questions needs an exhaustive database search to maintain the quality of results considering search strings. Utilizing keyword search terms, databases for literature search, and criteria for inclusion or exclusion are the three search approaches.

Step 3: Study selection and evaluation: according to the study scope from the literature search, the titles of the citations are collected by carrying out broad searches using the keyword combinations specified in Table 1. After determining the topic of the study, a set of keywords was determined and then utilized to search internet databases.

Step 4: Analysis and synthesis: a detailed summary of the knowledge discovered from the publications in relation to the chosen research questions during the evaluation process.

Step 5: Discussion of results: after an extensive review of the remaining research papers that meet the criteria for inclusion in the previous phases, the results from the analysis of the papers are summarized not only to demonstrate how they support, expand, or obtain the current research topic, but also to conduct the classification and identification from the most relevant and informative data. Study references of all publications that met the criteria for selection are reviewed in order to find additional records published during the examination timeframe that seem to be relevant to the goal of this study. Table 1 provides broad results of the selection method and displays the total number of articles retrieved by the academic search engine. A first search results in a total of 514 publications. Table 1 show the outcome of the search through several electronic databases. After a thorough search for the titles of derived citations, 158 articles were found. A number of duplicates that were discovered through repeated searches of electronic databases were disregarded. On the basis of, 147 articles were retained. Additionally, 89 publications were found to be not pertinent to the study after the additional extensive screening was conducted on the abstracts of the chosen titles. Following a thorough search for the chosen papers, 56 works (33 records from WOS, 19 records from Scopus, and 4 additional articles) were found after examining the introduction, methodology, and conclusion. A full text reading stage produced 56 articles overall.

4. Results

This study employed a systematic literature review on reverse logistics, with the variables utilized in this research provided as the unit of analysis. Table 2 displays the publication title, citation counts, and impact factor of the most cited publications. The most cited study, conducted by Nicolaou et al. [49], presents a complete literature analysis to assess RL processes' effectiveness on the basis of environmental, economic, and social components of sustainability. A multi-objective mathematical model for vehicle routing was established in a different study by Hashemi [13] in order to collect waste, lower emissions, and decrease the ratio of unmet customer demand to customer demand over all time periods. These were followed by a paper by Zarbakhshnia et al. [4], who introduces multi-attribute decision-making to outsource sustainable reverse logistics service provider. Another study addressed the impact of infrastructure on green logistics performance in the services sector by considering mediating factors of business performance and service quality [50]. Table 1 displays the developed data extraction techniques used for the selected studies, as well as the most frequently referenced papers published from 2011 to 2022 that pertain to the research subjects, providing a review and analysis of sustainable reverse logistics service quality.

Table 2. Significant publications and their citations.

No.	Research Author(s) and Title	Year	Citation	Publisher	IF
1	Nikolaou, Evangelinos [49]	2013	327	Elsevier	3.590
2	Bastas and Liyanage [42]	2018	224	Elsevier	6.97
3	Centobelli, Cerchione [51]	2017	213	Elsevier	4.04
4	Mavi, Goh [52]	2017	203	Springer	3.471
5	Prajapati, Kant [31]	2019	121	Elsevier	8.18
6	Hashemi [13]	2021	171	Elsevier	10.96
7	Zarbakhshnia, Wu [4]	2020	82	Elsevier	9.297
No.	**Research Author(s) and Title**	**Year**	**Citation**	**Publisher**	**IF**
8	Nouri, Nikabadi [53]	2018	54	Emerald Insight	2.23
9	Li, Kannan [21]	2018	45	Elsevier	6.97
10	Marić and Opazo-Basáez [17]	2019	40	Springer	3.51
11	Ozbekler and Ozturkoglu [24]	2020	39	WILEY	8.99
12	Persdotter Isaksson, Hulthén [29]	2019	28	MDPI	2.96
13	Jaaron and Backhouse [54]	2016	23	Emerald Insight	1.95
14	Dutta, Talaulikar [55]	2021	18	Elsevier	10.96
No.	**Research Author(s) and Title**	**Year**	**Citation**	**Publisher**	**IF**
15	Aćimović, Mijušković [56]	2020	14	Emerald Insight	3.87
16	Sajjanit and Rompho [15]	2019	11	Emerald Insight	4.37
17	Stevic, Tanackov [45]	2021	9	MDPI	3.889
18	U-Dominic, Orji [8]	2021	6	MDPI	3.251

4.1. Research Sources

The search results can be divided into eight groups depending on the type of publication, as demonstrated in this section. Research classifications show 82% of selected sources are journal articles, while 11% are conference proceedings. In addition, 7% of selected materials are books, while the remaining sources are conference reviews, reviews, chapters of books, editorials, and errata. The figures support the assertion that, in terms of scientific research, the search term is up to date.

4.2. Documents by Country

This section illustrates the ranking of countries based on the number of research related to the research keywords mentioned in Table 1 and Figure 3 shows the concentration of countries where the study was conducted: here, 59% were from Europe, followed by China, India, and Australia. The study addresses reverse logistics services, and each country has its own regulations and practices to address reverse logistics challenges; in addition, some countries achieved strides toward sustainability. Therefore, it is important to consider the nature of each country.
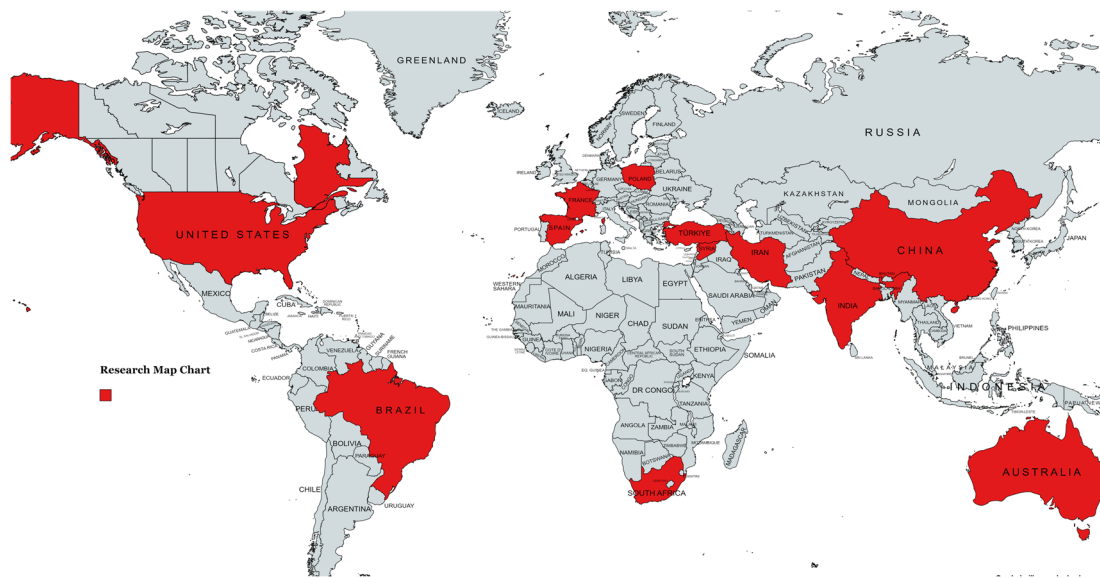
Figure 3. Research Map.

4.3. Documents by study fields

According to Figure 4, the main subject areas found in the databases showed that the main shares were related to reverse logistics (42%), sustainability (36%), and operation 31%; in addition, other areas that showed during the search were environment, service quality, and customer satisfaction, as shown in Table 1. The screening showed that reverse logistics was the most searched topic after sustainability, with a few studies that considered the quality of service and customer perception.
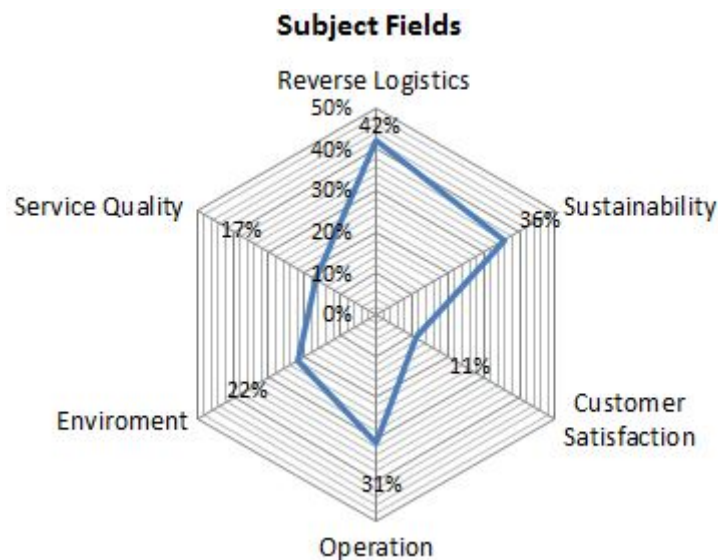
Figure 4. Documents by study field.

Furthermore, publications are also categorized in Figure 5 on the basis of their purpose. The main search term is "according to most of articles listed in the study". We found that 41% of the articles had titles relevant to reverse logistics operations elements, and more than 19% of the publications addressed it. In addition, 22% of the works on sustainable logistics are tied to sustainability. Depending on the research works' other aims, we found sustainable supply chain, environmental responsibility, and service quality in our search.
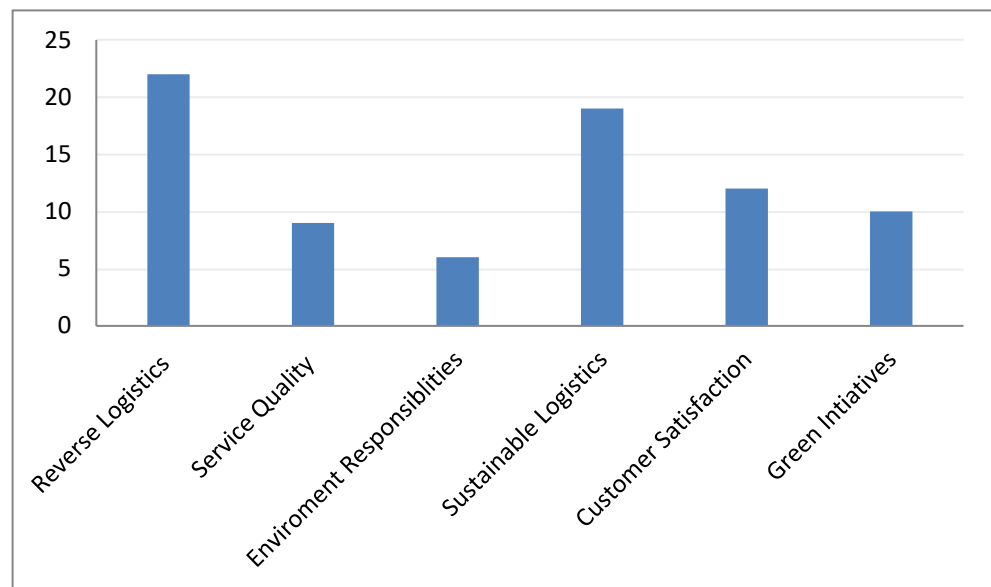
Figure 5. Categorization of Publications based on their Purpose.

4.4. Publications by Year

The publications are organized by publication date. Due to our date selection, all relevant publications were authored after 2011. Figure 6 displays the development for 56 papers' total listed articles for the period 2013 to 2022. The number of citations has been steadily growing and will reach a maximum in 2020. There are citations in 75% of all documents, wherein 13% contain fewer than three citations.
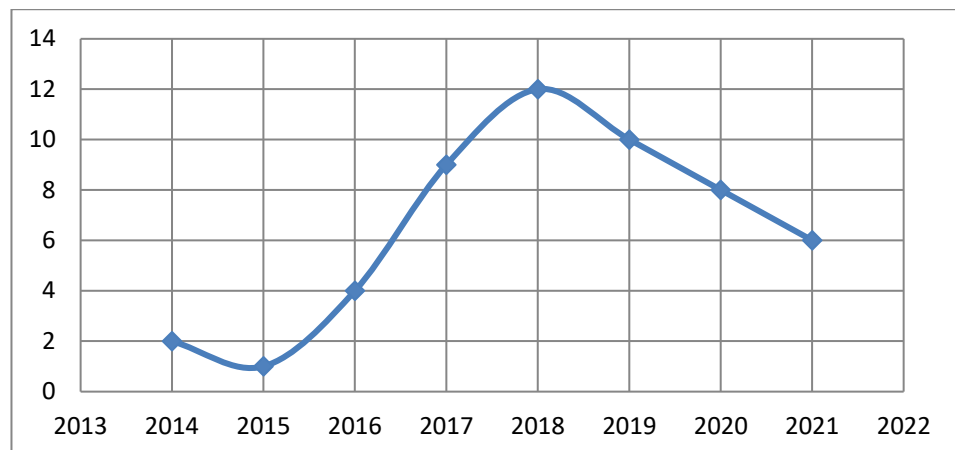

Figure 6. Publication by Year.

5. Discussion

The business sector is restructuring its supply chain network to control returns in an effort to satisfy increasing pressure to incorporate environmental and sustainability concerns as a result of legislation and rising public awareness. The researchers used a systematic literature review to develop a sustainable reverse logistic service quality SRLSQ framework by examining studies for SSQ practices and RLSQ operations, as shown in Figure 7. Combining the two variables, SSQ and RLSQ, using a collection of techniques that may be utilized by businesses, these tools have been defined and shown through our research procedures. The following sections will discuss the main factors that affect SRLSQ dimensions and how reverse logistics service providers utilize these approaches to create a sustainable approach, such as waste reduction and appropriate collection considering risk assessment of RL practices.
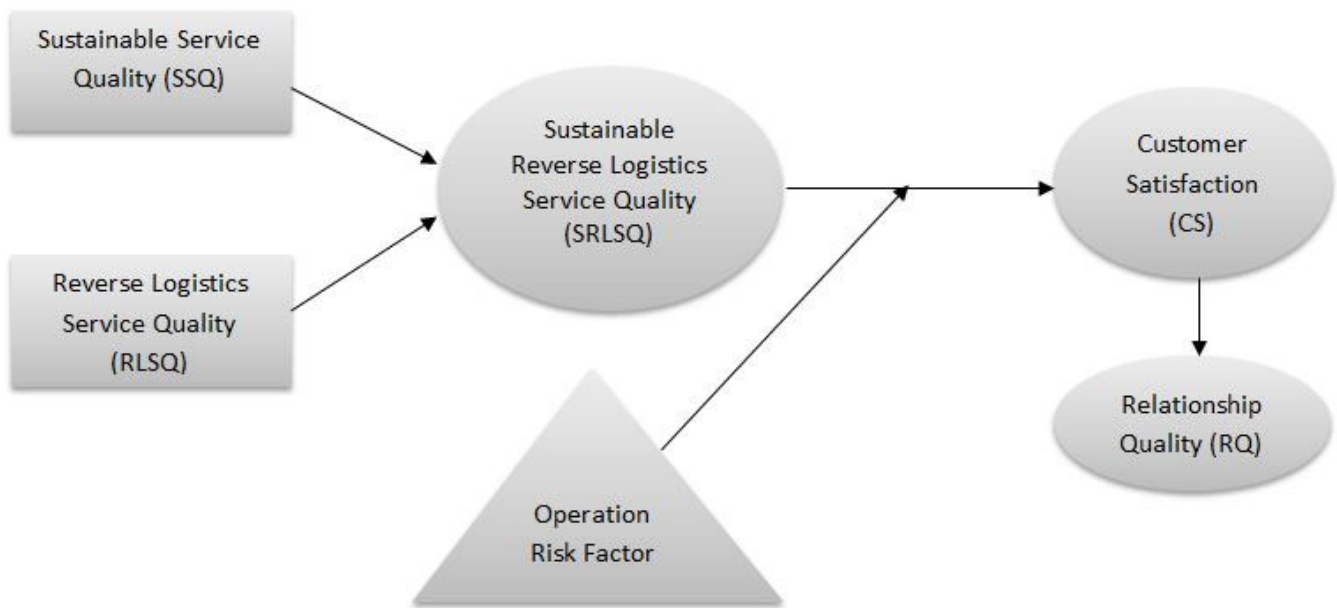
Figure 7. Sustainable reverse logistics service quality (SRLSQ) theoretical framework.

5.1. Sustainability and Multiple Goals in Service Quality Practices

In developed economies, firms are embracing green practices to enhance operational excellence by delivering sustainable service quality (SSQ). The adaptation of sustainable service quality (SSQ) is seen as a main factor for (SRLSQ) in logistics companies in this research. Previous studies have conducted researched in this field and have contributed to a reasonable comprehension of the sustainable practices of logistics providers in developing nations. Many case studies developed research questions related to the adoption of sustainable practices and their effect on service quality and customer satisfaction. Many case studies support the proposed structure to improved customer service in the logistics industry using the triple bottom line pillars (TBL) approach, as shown in Figure 1 (e.g., Evangelista et al. [57,58]). The first pillar that affects SSQ is the environmental initiative: the ever-increasing environmental perception in the markets and the growing environmental awareness of consumers appear to force enterprises worldwide to consider environmental quality through RL operation. However, in emerging economies, such as those in developing countries [59], RL is also driven by other factors, such as efficient and clean sustainable energy. Sustainable transportation also reduces packaging materials and waste reduction [60]. Decisions regarding waste disposal have a significant impact on the environment. The correct disposal method may aid in lowering the amount of garbage released into the environment. Much research has examined the effects of RL factors on environmental performance [50].

The second pillar of the TBL strategy is the economic initiative, which is described as the revenue rewards and expenditure savings. Equally important is the increased market share and company experiences that arise as a result of embracing ecological responsibility [50]. This study will evaluate the contribution of 3PRLP to the overall costs of their customers on the basis of the following economic performance criteria, such as return on investment, recapturing value, and disposal costs [60]. Economic performance and finance evaluates the effectiveness of a company's operations [61]. The prior studies discussed this performance aspect and the relation to market [62] financial performance (profitability) and economic performance [63], characteristics of the environment, and business image [64]. The third pillar is the social initiative; according to the literature, the social pillar is less researched as compared with the other pillars (environmental and economics pillars). Social performance can be considered as significant and complex for sustainability performance [65]. Social sustainability is concerned primarily with a company's strategic objectives [66]. It evaluates the social effects of the company's activities on its stakeholders [58]. Social performance consists of external stakeholders,

the community, employees, and the working conditions [67]. Employee satisfaction is substantially related to customer satisfaction and operational success [64].

5.2. Reverse Logistics Service Quality

After carrying out this study, we can see that reverse logistics service quality (RLSQ) is essential to identifying how users have responded to service quality processes and customer outcomes through the RL process. Customer satisfaction is one of the aims of RL practices that must be examined to control quality in RL. The study shows that customer relationship quality (RQ) is affected by the cooperation of partners through shared responsibility for the return of products, as well as effective disposal and reverse logistics activities. Sharing information regarding the status of a returned item, as well as the confidence, empathy, empowerment, reliability, and responsiveness of employees, has been associated with improved customer service quality in the context of product returns theoretically proposed by researchers (e.g., [15,38]). Other studies (e.g., [68,69]) conjectured that cost, financial standing, reputation, and service delivery quality are also subsidy factors throughout the product return service process that are necessary to guarantee the good performance of the RL channel. Consequently, reverse logistics practices (RL), combined with the service quality (SQ) dimensions, are considered as the main factors in the proposed conceptual framework (SRLSQ) model.

5.3. Customer Relationship and Operational Risk

Based on prior research, there is a lack of studies in this area. Operational risk was used as a mediator variable in the framework, as shown in Figure 7, to determine to what extent it mediates the relation between sustainable reverse logistics service quality and customer satisfaction. Risk evaluation of reverse logistics is vital for effective decision-making. It is an essential strategy for reducing operational risk and enhancing service quality. The greatest influence on customers' return channel loyalty is risk. [70]. The study conducted by Wang et al. [6] considered risk factor as the dominate driver in outsourcing reverse logistics activities. Third parties' reverse logistics evaluations are highlighted among risk factors; operational risk was shown to have the largest significance [52]. Perceived risk has the greatest influence on consumer retention, according to Xu and Jackson [70].

This study uses a conceptual framework to examine the effects of sustained service quality on customer satisfaction in order to explore and investigate the latter term. According to a prior study presented by Stamenkov et al. [71], sustainable service quality is the ability to deliver unbroken services with excellent sustainable quality SSQ for an extended period of time. On the other hand, prior studies show that RL practices and product return disposition decisions are crucial for implementing a sustainable business model, [72,73].

Consequently, the RL considers an open end of sustainability and customer satisfaction. This study concentrated on designing a theoretical framework that addresses sustainable service quality dimensions and reverse logistics service quality to enhance customer satisfaction and relationship quality in the presence of a risk factor; moreover, the study investigated a few constraints which can imply distinct issues and recommendations to potential researchers and practitioners in order to promote new practical initiatives utilizing this framework. Using this initiative, it is possible to test the impact that RL service quality combined with the sustainability pillars of quality of service would have on customer satisfaction and relationship quality. In addition to investigating and structuring the theoretical framework in the preceding sections, this study makes a genuine contribution to knowledge by constructing a complete, sustainable reverse logistics service quality index and evaluating its effect on customer satisfaction. The study focuses on research by logically linking the concepts of SSQ, RLSQ, and indicators to address various critical concerns connected to customer relationship quality and evaluating risk considerations as part of the criteria for reverse logistics services.

Based on all the points mentioned above, both the sustainable service quality pillars and reverse logistics service quality are considered as independent pillars; combining these

two variables creates a new pillar called sustainable reverse logistics service quality, which functions as the independent variable, while, on the other hand, customer satisfaction is considered as the dependent variable. According to the research questions and the research gap analysis, there is a link between SSQ and RLSQ on customer satisfaction and relationship quality; therefore, the main purpose of this work was to develop a sustainable reverse logistics service quality evaluation index system. Consequently, the scheme of the theoretical framework is presented in Figure 7.

6. Conclusions

In this study, the researchers found the following key findings: first, the majority of the previous studies focus on logistics as a whole process, logistics service quality, and sustainability in logistics in developed countries, primarily in Europe, the United States, and Asia, with only a few of the studies conducted in developing countries in Africa, such as Egypt. Secondly, through in-depth reviewing, we identified a few studies that are directed toward sustainability in reverse logistics services quality practices and its impact on customer satisfaction. Finally, there is a lack of studies that considered operational risk as a mediator variable that can have an effect on SRLSQ and its impact on consumer perception. Therefore, this article emphasizes exploring the role of SSQ and RLSQ, merging the two variables under the SRLSQ factor, thus assessing the impact of these factors on customer satisfaction (CS) and relationship quality (RQ) and employing the operational risk as a mediator variable.

7. Research Implications

7.1. Theoretical Implications

The theoretical implications of this study lie in revealing a knowledge gap by addressing the relationship of sustainable reverse logistics service quality through the triple bottom line approach on customer outcomes and relationship quality (RQ). In addition, this study proposes the use of operation risk as an important mediator variable to avoid any delay or inefficacy in implementation and customer satisfaction.

7.2. Practical Implications

Since the Egyptian market suffers from limited implementation of reverse logistics service and its sustainability, in practical terms, this study highlights the significance of reverse logistics service quality and its sustainability for decision-makers and stakeholders due to its impact on customer satisfaction. This work also serves as a study to consider the operational risk that can affect this significance.

8. Research Limitations and Future Work

Reviewing studies that the authors conducted are acknowledged. We have restricted our search to only English-language publications. It would have been difficult to locate the relevant literature using keywords, titles, or abstracts translated from many languages. Our work centered on sustainability and RL research from the perspective of RQ. It excludes key waste management components that are essential to the RL viewpoint. However, because the area is expanding, a more holistic and exhaustive evaluation is outside the scope of this study. Future work in this field could focus on identifying, describing, and defining the relationship among the reverse logistics (RL) activities, the information, material, and financial flows that make up the reverse channels, and the responsibilities of the members of these channels in relation to each RL activity by examining this framework in various contexts of waste, environmental regulations, and supply chain stakeholders. The impact of organizational performance and long-term competitive advantage will be the subject of another study in the future.

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