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**Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi**
Yıl: 2026 Sayfa: 1-19
https://dergipark.org.tr/tr/pub/cusosbil

**DOI: 10.35379/cusosbil.1686836**

**Geliş** Received: **29.04.2025**
**Kabul** Accepted: **10.12.2025**

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**Keywords:**
Disaster and Humanitarian Aid Logistics
Bibliometric Analysis
Visual Mapping
WoS

**Anahtar Kelimeler:**
Afet ve İnsani Yardım Lojistiği
Bibliyometrik Analiz
Görsel Haritalama
WoS

## ABSTRACT

This study uses a visual mapping method to evaluate publications related to disaster and humanitarian aid logistics from 2009 to 2024. In this regard, the SSCI, SCI-E, and ESCI indices were selected from the Web of Science database, and a search was performed using the term “disaster and humanitarian aid logistics.” A total of 1,075 publications containing this phrase across all fields were identified. Subsequently, these publications were visualized and analyzed through the VOSviewer mapping method. The most frequently cited keyword in the findings was "Humanitarian Logistics." The authors who published the most were Peter Tatham and Van Wassenhove, while the most cited work was attributed to Balcik et al. Notably, the United States had the highest number of publications and citations among countries. Researchers Peter Tatham and Van Wassenhove are particularly recognized for their extensive co-authorship networks. The Emerald Group Publishing emerged as the leading publisher by publication volume, while the Journal of Humanitarian Logistics and Supply Chain Management was identified as the premier journal in this field. A substantial number of publications originated in the fields of Business and Economics, with Sustainable Cities and Communities (SDG 11) highlighted as a key focus area in sustainable development.

## ÖZ

Bu çalışmada, 2009-2024 yılları arasında afet ve insani yardım lojistiği ile ilgili yayınları değerlendirmek için görsel haritalama yöntemi kullanılmıştır. Bu bağlamda, SSCI, SCI-E ve ESCI indeksleri Web of Science veri tabanından seçilmiş ve “afet ve insani yardım lojistiği” terimi kullanılarak bir arama yapılmıştır. Tüm alanlarda bu ifadeyi içeren toplam 1.075 yayın belirlenmiştir. Daha sonra bu yayınlar, VOSviewer haritalama yöntemiyle görselleştirilerek analiz edilmiştir. Bulgularda en sık atıfta bulunulan anahtar kelime “İnsani Lojistik” olmuştur. En çok yayın yapan yazarlar Peter Tatham ve Van Wassenhove olurken, en çok atıfta bulunulan çalışma Balcik vd.'ye atfedilmiştir. Özellikle, Amerika Birleşik Devletleri ülkeler arasında en fazla yayın ve atıf sayısına sahipti. Araştırmacılar Peter Tatham ve Van Wassenhove kapsamlı ortak yazarlıkları nedeniyle takdir edilmektedir. Emerald Group Publishing, yayın hacmi açısından önde gelen yayıncılar arasında yer alırken, Journal of Humanitarian Logistics and Supply Chain Management bu alandaki en önemli dergi olarak belirlendi. Önemli sayıda yayın, Sürdürülebilir Şehirler ve Topluluklar (SDGs-11) kapsamında, sürdürülebilir kalkınmada temel bir odak alanı olarak vurgulanan İş ve Ekonomi alanlarından kaynaklanmaktadır.

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Alıntılamak için/Cite as: Özekenci E. K., (2026) A Visual Analysis Of Research Trends On Disaster And Humanitarian Aid Logistics Using The Web Of Science Database, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, s.1-19

## INTRODUCTION

Beginning in the 1950s, there has been a notable increase in both the frequency and severity of disasters, which has correspondingly affected the number of individuals impacted (Boonmee et al., 2017). The Emergency Events Database (EM-DAT) recorded 399 disasters linked to natural hazards, resulting in 86,473 fatalities and affecting approximately 93.1 million individuals. The economic losses from these events reached a staggering US$202.7 billion. The most catastrophic incident of the year was the 2023 earthquake in Türkiye and the Syrian Arab Republic, which claimed 56,683 lives and incurred damages of US$42.9 billion. This devastating earthquake affected an estimated 18 million people across both countries, making it the second-most significant event in terms of the number of people affected. The most impactful event, however, was the 2023 Indonesian Drought, which affected 18.8 million people from June to September 2023 (CRED, 2025). A disaster is characterized as an event that occurs within a defined time and place, posing considerable threats to a community and leading to significant losses for its members and physical assets. Such disruptions can hinder society's essential functions. Disasters occur frequently worldwide and are increasingly recognized as interconnected events rather than isolated occurrences. Consequently, disaster management has become a vital consideration in urban development and human security (Das, 2018).

Human-made and natural disasters negatively impact the built environment. The extensive damage to buildings and infrastructure is accompanied by injuries and fatalities, loss of income sources, and the stagnation or reversal of local economies (Baarimah et al., 2021). Large-scale disasters—such as the earthquake and subsequent tsunami in Indonesia (Hadiguna et al., 2014), the devastating Wenchuan earthquake in China (Hu & Sheu, 2013), the 2010 flood in Pakistan (Ali et al., 2022), and the coronavirus disease pandemic (Lindert et al., 2021)—exert profound and lasting effects on the populations of the affected regions. Consequently, many countries recognize the importance of integrating disaster management into their national policy frameworks. In a disaster scenario, logistics play a crucial role, significantly influencing the success or failure of relief operations. While the immediate consequences of a disaster are often evident in human casualties and disrupted livelihoods, significant economic losses accompany these events. From this standpoint, effective disaster management and relief efforts demand complex logistical operations, as the necessary resources are rarely available at the disaster site. These logistical operations are commonly referred to as Humanitarian Logistics. Logistics emerge as a pivotal function in a disaster, determining whether a relief operation succeeds or fails. Indeed, while the primary impact of a disaster is reflected in human mortality and the disruption of lives, the economic repercussions are also substantial. Consequently, efficient disaster management and the delivery of relief aid require intricate logistical operations, which are vital for addressing unmet needs at the disaster site. These activities are generally referred to as Humanitarian logistics (Jabbour et al., 2019).

Humanitarian logistics involves the strategic planning, execution, and management of the efficient and cost-effective movement and storage of goods and materials, along with the associated information. This process spans from the point of origin to the point of consumption, ensuring that the needs of the end beneficiaries are met effectively. Humanitarian logistics and supply chain management are critical in preparing for and responding to disasters and global health emergencies. They are crucial for alleviating the suffering of vulnerable populations and ensuring adequate support and aid delivery during urgent situations (Altay et al., 2023). Logistics planning during emergencies involves quickly dispatching essential items such as medical supplies, personnel, specialized rescue equipment, and food to distribution centers in the affected areas. This prompt action is crucial for speeding up relief operations and ensuring an effective crisis response (Özdamar et al., 2004). Logistics support and evacuation are crucial elements of disaster response. Evacuation activities are primarily carried out during the initial response phase. In contrast, logistics support operations often extend over a longer period to address the ongoing basic needs of survivors in the affected areas. The timely availability of essential commodities, including food, shelter, and medicine, along with the efficient

transportation of the injured, significantly influences survival rates in these regions (Yi & Özdamar, 2007). Moreover, humanitarian logistics encompasses activities marked by intrinsic complexities, including dynamic challenges, resource constraints, transportation and communication network interruptions, and the challenge of accurately predicting demand. These elements lead to significant uncertainty in the logistical operations associated with humanitarian efforts (Quispe et al., 2024).

Humanitarian logistics has long been considered an emerging discipline. Although research in this field was relatively limited before the mid-2000s, it has experienced a significant surge since several groundbreaking articles were published almost simultaneously between 2005 and 2007. This growth has been well documented in various systematic literature reviews over recent decades (Altay et al., 2021). Bibliometric analysis has recently gained importance as a rigorous and effective methodology for exploring and reviewing literature in the social sciences (Öztürk et al., 2024). Bibliometrics involves using mathematical and statistical techniques to analyze scholarly publications. Alfred Lotka and Samuel Bradford led the initial systematic efforts in data collection and established the foundational principles of bibliometrics. Eugene Garfield, who introduced routine citation analysis and organized data processing methods, largely contributed to the modern advancement of this field. Key components of bibliometric analysis include database coverage, data consistency and accuracy, various data fields, search options, and the interpretation and application of metrics (Thompson & Walker, 2015). Bibliometrics comprises the systematic analysis of published materials, including books, journal articles, datasets, and blogs, alongside pertinent metadata such as abstracts, keywords, and citations. This analysis employs statistical methods to elucidate the relationships among various published works (Ninkov et al., 2021). The bibliometric approach to literature reviews has recently gained popularity for several reasons, including the emergence of advanced software tools, the incorporation of cross-disciplinary methodologies, and improved capacity for handling large datasets. Using objective quantitative methods and bibliometric techniques effectively mitigates the sample selection bias often present in systematic reviews. Additionally, these methodologies are particularly adept at assessing journal performance, analyzing co-authorship and co-citation trends, and mapping seminal research streams within specific fields (Khan et al., 2021). Moreover, scholars use bibliometric analysis to identify emerging trends in article and journal performance, examine collaboration patterns, and analyze research components. This approach allows for the exploration of the intellectual structure within specific domains of the existing literature. Apart from this, bibliometric analysis is a valuable tool for interpreting and mapping the accumulation of scientific knowledge and tracing the evolution of established fields. It methodically organizes and structures substantial volumes of unstructured data. Consequently, well-executed bibliometric studies can establish a robust foundation for advancing a field in innovative and meaningful ways. This approach enables scholars to (1) obtain a comprehensive overview, (2) identify gaps in current knowledge, (3) generate original research ideas, and (4) strategically position their contributions within the academic landscape (Donthu et al., 2021). Consequently, this study aims to analyze relevant research within the Web of Science (WoS) database during that period using bibliometric analysis and to create visual maps. To achieve this, the study will address the following research questions:

- What is the distribution of publications on disaster and humanitarian aid logistics in the WoS database from 2009 to 2024?
- Which keywords are most frequently used in publications related to disaster and humanitarian aid logistics in the WoS database?
- Which countries have the highest number of publications on disaster and humanitarian aid logistics in the WoS database?
- Who are the researchers with the most co-authored works in disaster and humanitarian aid logistics in the WoS database?
- Which researchers have the highest publication counts in disaster and humanitarian aid logistics within the WoS database?

- Which countries and publications are most cited in the WoS database in disaster and humanitarian aid logistics?
- How are the disaster and humanitarian aid logistics publications distributed among various journals?
- How are the disaster and humanitarian aid logistics publications distributed among different publishers?
- What research areas are represented in publications on disaster and humanitarian aid logistics in the WoS database?
- How are the publications on disaster and humanitarian aid logistics categorized into Sustainable Development Goals (SDGs) in the WoS database?
- Which articles have the highest citations among studies published from 2009 to 2024 in the field of disaster and humanitarian aid logistics?

The remainder of this paper is structured as follows: Section two provides an overview of the materials and methods, detailing the research design, data sources, and methodologies utilized in the study. Section three presents the key findings derived from the analysis. In section four, these findings are critically examined and interpreted in light of existing literature and theoretical frameworks. The final section provides a summary of the main findings and their broader implications. It emphasizes the study's contributions to the field, discusses potential policy and practical applications, and presents recommendations for future research.

## LITERATURE REVIEW

In recent years, research in humanitarian logistics has grown notably, highlighting its increasing strategic and academic importance in managing global crises and disaster response. Researchers have increasingly utilized bibliometric analysis to map the intellectual landscape of this field, identify prevailing themes, and trace the evolution of key research clusters over time. In this context, Table 1 presents an overview of the existing literature, summarizing the main topics, time periods, and databases utilized in previous studies.



**Table 1. Previous research on humanitarian logistics**

| Author(s) | Year | Time Frame | Database | Topic |
|---|---|---|---|---|
| Rejeb et al. | 2019 | 1978-2020 | Scopus | Conducted a thorough bibliometric analysis to identify emerging trends in humanitarian logistics research. |
| Fu et al. | 2021 | 2011-2020 | WoS - Scopus | Developed a visual representation of the frontiers and dynamic trends within the field of humanitarian logistics. |
| Argumedo-García et al. | 2021 | 1983-2021 | Scopus | Investigated the technological potential and innovations in humanitarian supply chains through bibliometric methods. |
| Khan et al. | 2022 | 2006-2021 | WoS - Scopus | Analyzed research trends concerning humanitarian logistics and sustainable development using bibliometric techniques. |
| Fosso Wamba | 2022 | 1967-2020 | WoS | Examined a bibliometric analysis that outlines future research directions in humanitarian supply chain management. |
| Kim et al. | 2022 | 1986-2018 | Scopus | Performed a systematic literature review employing network analysis and topic modeling to examine humanitarian logistics. |
| Abdul Rahman et al. | 2022 | 2006-2022 | Scopus | Explored trends in humanitarian supply chains before, during, and after the COVID-19 pandemic. |
| Ha et al. | 2023 | 2005-2020 | WoS | Provided a bibliometric analysis while identifying future directions for last-mile delivery in humanitarian logistics. |
| Carnero Quispe et al. | 2024 | 2011-2023 | WoS - Scopus | Offered a systematic review of prioritization models utilized in decision-making processes within humanitarian logistics. |
| Ferreira et al. | 2024 | 2004-2023 | WoS - Scopus | Presented a systematic review of the humanitarian logistics literature utilizing bibliometric techniques. |
| Aktas Potur et al. | 2025 | 2000-2024 | WoS - Scopus | Conducted a bibliometric analysis of multi-criteria decision-making techniques in disaster management and emergency transportation. |

### Research Gap

Based on the previous studies presented in Table 1, this research identifies several critical gaps in the existing humanitarian logistics literature. While previous research has examined humanitarian logistics from various perspectives using bibliometric and systematic approaches, most studies have primarily relied on Scopus or a combination of WoS and Scopus datasets, focusing on specific subthemes such as technology adoption, last-mile delivery, or prioritization models. Consequently, there is a significant lack of a comprehensive bibliometric study that solely utilizes WoS and integrates co-citation, co-authorship, and keyword mapping analyses to provide a cohesive overview of global research trends. In particular, no research has systematically examined the 2009–2024 period using a WoS-exclusive bibliometric mapping approach, which is essential for understanding the changes driven by global crises, digital transformation, and sustainability objectives. Additionally, the relationship between humanitarian logistics and the SDGs has been significantly overlooked. This study seeks to fill these gaps by conducting a bibliometric analysis of humanitarian logistics research from 2009 to 2024, highlighting the thematic connections between humanitarian logistics and the SDGs.

## MATERIALS AND METHODS

### Data Collection and Processing

The WoS database is one of the most frequently used databases for accessing journals within the field of social sciences (Chadegani et al., 2013; Zhu & Liu, 2020; Pranckutė, 2021). Additionally, the WoS is one of the most comprehensive databases in the world, containing a vast array of high-quality publications that effectively illustrate the research landscape and scope within this area (Sánchez et al., 2017). Therefore, this database was selected to examine publications on disaster and humanitarian aid logistics. This study aims to assess publications related to disaster and humanitarian aid logistics from 2009 to 2024 using a visual mapping method. The timeframe from 2009 to 2024 was chosen based on empirical evidence and bibliometric research standards. A search conducted in the Web of Science on February 14, 2025, identified 1,093 publications on disaster and humanitarian aid logistics. While the earliest publication dates back to 2004, only two studies were published before 2009, underscoring the limited research activity during that early period. Since 2009, there has been a notable increase in the frequency of publications in humanitarian logistics, indicating a systematic advancement in research within this field. This surge aligns with significant global events, such as the rise in natural disasters and the evolution of humanitarian response mechanisms, which have contributed to the academic establishment of the discipline. Consequently, defining the evaluation period from 2009 to 2024 encompasses both the productive and mature phases of humanitarian logistics research. The SSCI, SCI-E, and ESCI indexes were selected for analysis. The bibliometric search encompassed 1,075 publications from 2009 to 2024. The VOSviewer software was employed to create the visual maps. Figure 1 presents a flowchart illustrating the research methodology.

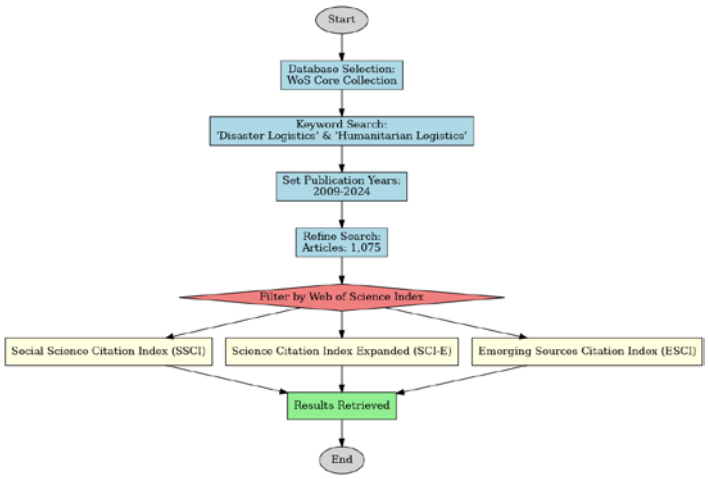


**Figure 1.** Research Process, Source: Compiled by the author

### Analytical Method

The term "bibliometrics" was first found in its French equivalent within a section titled “Le Livre et la Mesure. Bibliométrie” in Paul Otlet's book, "Traité de Documentation." However, the term is believed to have gained international recognition largely due to Pritchard's work in 1969. Bibliometrics is the application of mathematical and statistical methods to books and

other forms of written communication (Mejia et al., 2021). Bibliometric research provides unique opportunities to improve both theory and practice. Numerous impactful articles employing bibliometric techniques have been published by leading journals and scholars across various disciplines, exploring the evolutionary aspects of different fields and capturing emerging trends (Mukherjee et al., 2022). Bibliometric analysis is a crucial tool for evaluating the scientific output of entities such as papers, authors, keywords, journals, institutions, and countries across any research field. Analyzing the relationships and interactions among these entities provides insights into how the field's intellectual, social, and conceptual structures have evolved over time. Apart from this, bibliometric analysis is the process of gathering and evaluating scientific outputs by examining publications within a specific field or academic journal. This analysis is supported by numerical assessments and statistics based on various bibliometric indicators, including the number of articles published each year, the most-studied topics, the universities with the highest publication rates, the leading journals in the field, authors with the most publications, citation counts, and relevant keywords. (Öztürk et al., 2024). Consequently, a refined search equation was formulated, incorporating targeted filters to improve the clarity of advancements in this field. These filters successfully narrowed the research scope, ensuring that only publications directly relevant to the topic were considered. The search query, along with relevant keywords for "Disaster Logistics" and "Humanitarian Logistics," is shown in Table 2.

**Table 2. Equation Formulation**

| Database | Equation Search |
|---|---|
| WoS | (TOPIC-KEYWORDS ("Disaster Logistics" AND "Humanitarian Logistics") AND PUBYEAR > 2009 AND PUBYEAR < 2024 AND (LIMIT-TO (SRCTYPE, "Open Access")) AND (LIMIT-TO (DOCTYPE, "Article")) AND (LIMIT-TO (SUBJAREA, "Operations Research Management Science") OR LIMIT-TO (SUBJAREA, "Transportation") OR LIMIT-TO (SUBJAREA, "Business & Economics") OR LIMIT-TO (SUBJAREA, "Engineering")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (WOSCATEGORIES, "SCI-E") OR (LIMIT-TO (WOSCATEGORIES, "SSCI") OR (LIMIT-TO (WOSCATEGORIES, "ESCI") |

## RESULTS

In this section, we present the visual maps resulting from a bibliometric analysis of 1,075 articles, along with their interpretations.

### An Overview of the Publication Years

The bibliometric analysis was conducted on 1,075 articles. Figure 2 presents the annual publication number of these articles from 2009 to 2024.

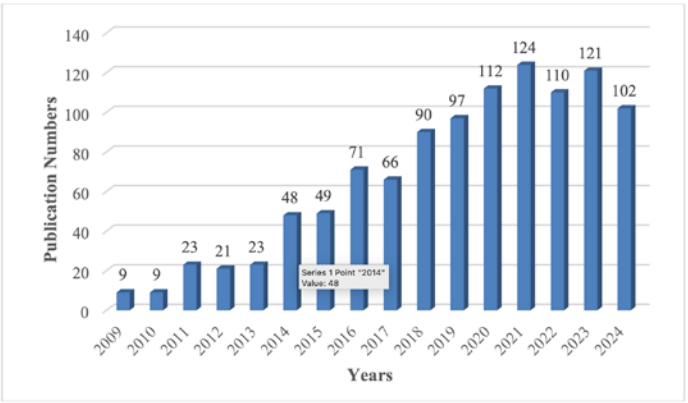


**Figure 2.** Publication years

Figure 2 shows the total number of publications related to disaster and humanitarian aid logistics and their annual distribution. A closer examination of the graph reveals that 2021 had the highest volume of publications, with 124 articles. Before 2016, the number of publications was fewer than 50, but there has been a significant increase since then.

### The Distribution of the Keywords

The study topics are represented by keywords, which are analyzed to examine the development of research hotspots and themes using co-occurrence analysis (Pan et al., 2023). Figure 3 illustrates the most commonly used keywords in articles related to disaster and humanitarian aid logistics.

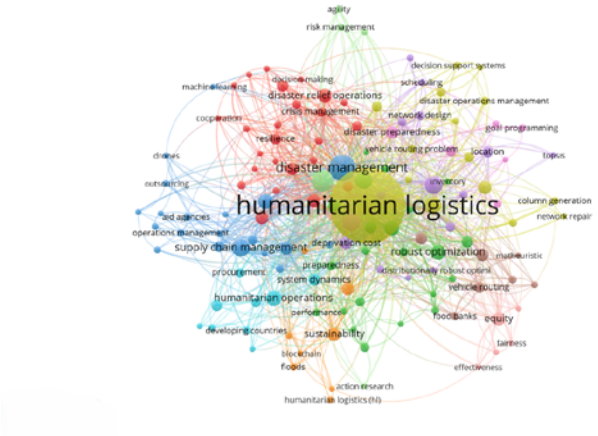


**Figure 3.** Most used keywords. Source: Elaboration from VOSviewer

A total of 2,919 keywords were employed in the publications analyzed. To achieve more effective results, only keywords that were repeated more than five times were considered. Among these, 137 keywords were repeated five or more times. In the accompanying image, node size indicates the frequency of each keyword's occurrence in the publications. "Humanitarian Logistics" was the most frequently used keyword, appearing 635 times. Following it, "Disaster Management" was mentioned 78 times, making it the second most common keyword. "Humanitarian Supply Chain" ranked third, totaling 55 occurrences. The keywords are organized into 11 distinct color clusters, each corresponding to a specific cluster. Closely related terms are grouped within the same cluster and share the same color. The short distance between terms suggests a higher probability of their co-occurrence in the same article abstracts and titles (Waltman et al., 2010).

## Countries with the Most Publications

A bibliometric analysis revealed the countries with the highest number of publications in disaster and humanitarian aid logistics. To improve the interpretation of the visual map, a minimum of 5 publications was required. Notably, 48 of the 78 countries studied have achieved at least 5 publications. Figure 4 displays the countries with the most publications in disaster and humanitarian logistics.

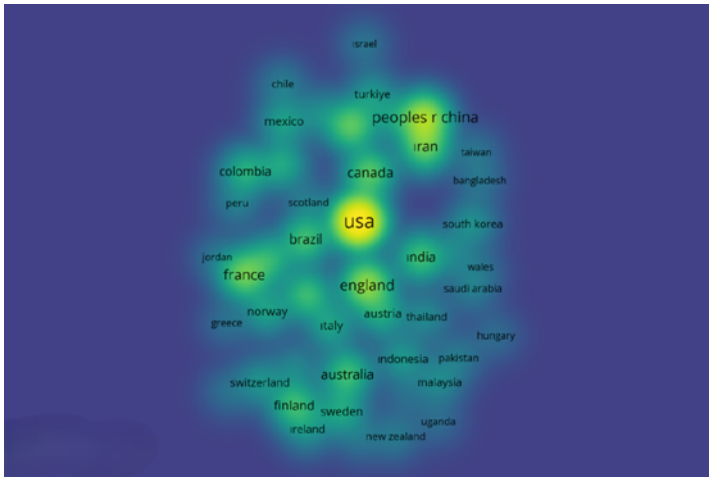


**Figure 4.** Countries with the most publications. Source: Elaboration from VOSviewer

The density visualization in Figure 4 highlights differences in publication volumes across countries through an engaging color gradient. Areas shaded in deep blue indicate a lower volume of publications, whereas regions shaded in vibrant yellow indicate a higher volume of publications. The United States stands out as the frontrunner, boasting 266 publications. Following closely is China, contributing significantly with 114 publications, while England secures third place with 99. France and Iran also make contributions, with 76 and 69 publications, respectively, enhancing academic efforts in this field.

## An Overview of the Co-Authorship Analysis

Co-authorship analysis examines the interrelationships between literature and the scientific collaboration among authors (Liu et al., 2005; González-Teruel et al., 2015). In this analysis, 2,332 researchers were identified. When considering only researchers with at least 3 publications and citations, the number was reduced to 209. Figure 5 illustrates the researchers with the highest levels of co-authorship in disaster and humanitarian aid logistics

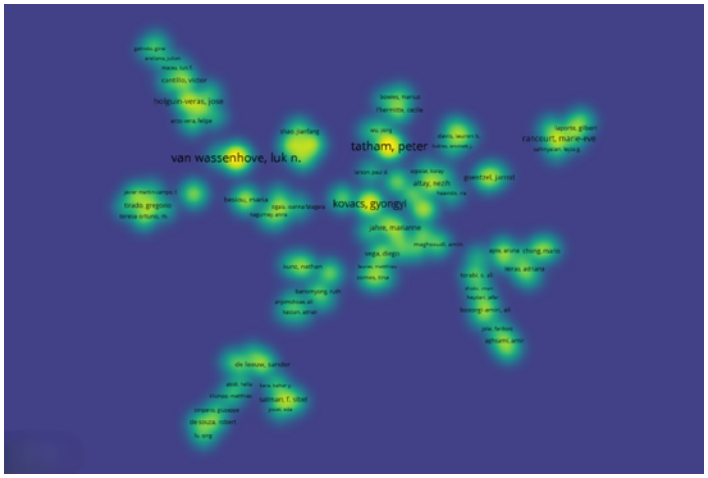


**Figure 5.** Researchers with the Most Co-Authorization. Source: Elaboration from VOSviewer

Figure 5's density visualization shows how the hue of the fields representing the researchers' names changes with the number of co-authors. Names exhibiting a deep blue color indicate limited co-authorships, while authors with a prominent yellow hue have more co-authorships. Within this context, it is evident that Van Wassenhove and Peter Tatham are the researchers with the highest number of co-authorships, with 26 publications. Kovacs Gyongyi ranks third with 19 publications, followed by Holguin-Veras Jose and Liang Liang, who tied fourth place with 12 publications each.

### An Overview of the Top Publishing Researchers

The following figure highlights researchers with the highest number of publications. Out of 76 researchers who have published at least five articles and received citations, the top 15 have been selected for this group. Figure 6 illustrates the groupings of these researchers and their relationships.

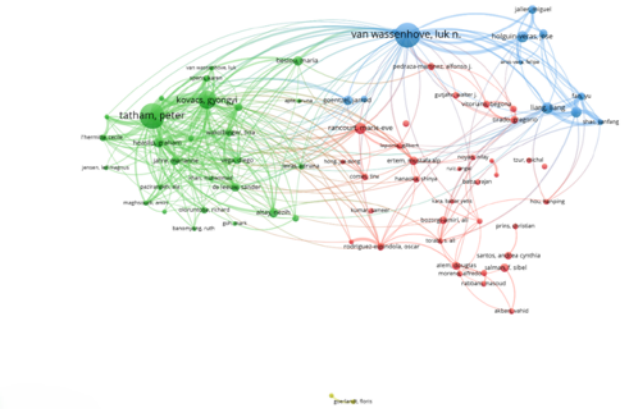


**Figure 6.** Top Publishing Researchers. Source: Elaboration from VOSviewer

In Figure 6, the researchers with the most publications are Tatham Peter and Van Wassenhove, each with 26 publications. They are followed by Kovacs Gyongyi, who has 19 publications. Notably, Van Wassenhove and Kovacs Gyongyi also have higher citation counts than other authors, with 1,913 and 1,368 citations, respectively. Additionally, Holguin-Veras Jose and Jaller Miguel have made significant contributions to the field. The publication and citation count for other researchers are detailed in Table 2.

**Table 2. Authors and Number of Publications**

| No | Author Name | Number of Publications | Number of Citations |
|---|---|---|---|
| 1 | Van Wassenhove | 26 | 1913 |
| 2 | Tatham Peter | 26 | 982 |
| 3 | Kovacs Gyongyi | 19 | 1368 |
| 4 | Holguín-Veras José | 12 | 1224 |
| 5 | Rancourt Marie-Eve | 12 | 225 |
| 6 | Liang Liang | 12 | 187 |
| 7 | Heaslip Graham | 11 | 290 |
| 8 | Wang Xihui | 11 | 113 |
| 9 | Goentzel Jarrod | 10 | 387 |
| 10 | Besiou Maria | 10 | 370 |
| 11 | Altay Nezih | 10 | 252 |
| 12 | Jaller Miguel | 9 | 1036 |
| 13 | Ertem Mustafa Alp | 9 | 424 |
| 14 | Alem Douglas | 9 | 391 |
| 15 | Salman Sibel | 9 | 352 |

## Most Cited Countries and Publications

The findings from the bibliometric analysis reveal that 48 of 78 countries have at least 5 publications and citations, indicating the nations with the highest citation counts. Figure 7 shows the most-cited countries in disaster and humanitarian aid logistics research.


**Figure 7.** Most Cited Countries. Source: Elaboration from VOSviewer

Figure 7 shows that the country with the most citations is the United States, with 9,482. Following the United States, the countries with notable citation counts include England (3,512), France (3,217), Türkiye (2,868), and Iran (2,635). Additionally, there are observable clusters and connections between countries. For instance, the United States, Brazil, Canada, and China form a single cluster, indicating frequent collaboration among these nations.

The presence of citations in published works indicates the influence of a particular research topic. Based on the bibliometric analysis, among the 1,075 publications with the highest citation counts, 774 have received at least five citations. Figure 8 presents the most cited publications in disaster and humanitarian aid logistics research.

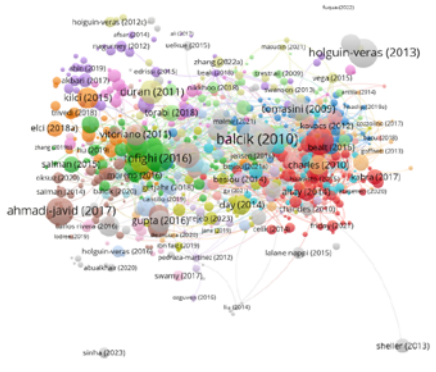


**Figure 8.** Most Cited Publications. Source: Elaboration from VOSviewer,

Figure 8 illustrates the publications with the most citations. The size of the nodes reflects the frequency with which an author's name appears in the literature. Noteworthy is Balcik's (2010) most-cited publication, which has amassed 544 citations. In this study, Balcik explores the challenges of coordinating humanitarian relief chains and discusses current and emerging practices in disaster relief logistics. Close behind is Holguin-Veras (2012), with 359 citations, who illuminates the differences between commercial logistics and the essential components of Humanitarian Logistics.

## Most Published Journals

The number of published papers in a journal, coupled with the citations it receives, serves as a crucial indicator of that publication's influence within a particular research domain (Choudhri et al., 2015; Chiu et al., 2021; Peng et al., 2022). The bibliometric analysis identified the ten most significant journals in disaster and humanitarian aid logistics research. Table 3 showcases the top 10 journals ranked by publication volume.

**Table 3. Most Published Journal**

| Journal Name | Number of Publications |
|---|---|
| Journal of Humanitarian Logistics and Supply Chain Management | 256 |
| Annals of Operations Research | 51 |
| European Journal of Operational Research | 50 |
| International Journal of Disaster Risk Reduction | 41 |
| Transportation Research Part E Logistics and Transportation Review | 31 |
| Production and Operations Management | 29 |
| Computers Industrial Engineering | 28 |
| Socio-Economic Planning Sciences | 23 |
| International Journal of Production Economics | 20 |
| Sustainability | 20 |

Table 3 presents the journals with the highest publication rates in disaster and humanitarian aid logistics, along with the distribution of their publications. The Journal of Humanitarian Logistics and Supply Chain Management stands out with 256 publications, making it the leading journal in this field. It is followed by the Annals of Operations Research, which has published 51 articles, and the European Journal of Operational Research, which has contributed 50 publications.

### Leading Publishers

There has been growing interest in the publishing industry as a focal area of research, as evidenced by the significant increase in the number of works published globally. Additionally, the publishing industry is vital in promoting economic development in several countries (Magadán-Díaz & Rivas-García, 2022). Bibliometric analysis has identified the 10 most prominent publishers of disaster and humanitarian aid logistics research. Table 4 presents these top ten publishers ranked by their publication volume.

**Table 4. Leading Publishers**

| Publisher Name | Origin | Number of Publications |
|---|---|---|
| Emerald Group Publishing | Great Britain | 314 |
| Elsevier | The Netherlands | 282 |
| Springer Nature | The United States | 121 |
| Wiley | The United States | 87 |
| Taylor & Francis | Great Britain | 56 |
| MDPI | Switzerland | 51 |
| Inderscience Enterprises Ltd. | Switzerland | 15 |
| Informs | The United States | 13 |
| IEEE | The United States | 12 |
| Sage | The United States | 10 |

Table 4 illustrates the publishers with the highest publication numbers in the field of disaster and humanitarian aid logistics, along with the distribution of their publications. The Emerald Group Publishing leads with 314 publications, followed by Elsevier with 282, and Springer Nature with 121. The findings also highlight the dominance of American publishers in relevant fields: five of the ten publishers are from the United States.

### An Overview of Research Areas

One of the most critical aspects of conducting effective research is assessing the maturity of a research area (Keathley-Herring et al., 2016). Bibliometric analysis has identified the ten most prominent research areas in disaster and humanitarian aid logistics. Table 5 ranks these areas by publication volume.

**Table 5. Research Areas**

| Research Areas | Number of Publications |
|---|---|
| Business & Economics | 555 |
| Operations Research Management Science | 391 |
| Engineering | 263 |
| Computer Science | 99 |
| Transportation | 74 |
| Environmental Science Ecology | 57 |
| Geology | 56 |
| Meteorology Atmospheric Sciences | 53 |
| Water Resources | 53 |
| Science Technology Other Topics | 34 |

Table 5 presents the research areas with the highest publication counts in disaster and humanitarian aid logistics. Business and Economics ranks highest with 555 publications, followed by Operations Research: Management Science with 391 articles, and Engineering with 263 publications. These findings underscore the substantial number of publications in the Business and Economics fields.

### An Overview of the SDGs

Every component of the SDGs is crucial for driving transformative changes across economic, political, technological, and social dimensions to achieve long-term sustainable development (Hák et al., 2016; Sachs et al., 2019). Bibliometric analysis has identified the most significant SDGs within disaster and humanitarian aid logistics research. As shown in Table 6, the 10 SDGs most prominently linked to disaster and humanitarian aid logistics research have been ranked by the number of publications.

**Table 6. Distribution of the SDGs**

| Sustainable Development Goals | Relevant Indicator | Number of Publications |
|---|---|---|
| Sustainable Cities and Communities | SDG-11 | 101 |
| Good Health and Well Being | SDG-3 | 25 |
| Responsible Consumption and Production | SDG-12 | 24 |
| Climate Action | SDG-13 | 23 |
| Life on Land | SDG-15 | 20 |
| Zero Hunger | SDG-2 | 19 |
| Life Below Water | SDG-14 | 19 |
| Industry Innovation and Infrastructure | SDG-9 | 14 |
| Quality Education | SDG-4 | 4 |
| Affordable and Clean Energy | SDG-7 | 3 |

Table 6 presents the SDGs with the highest number of publications in disaster and humanitarian aid logistics. Sustainable Cities and Communities stands out as the leader with 101 publications, followed by Good Health and Well-Being with 25 publications, and Responsible Consumption and Production with 24 publications. These results highlight the dominant role of Sustainable Cities and Communities, as nearly half of the articles focus on SDG-11.

### An Overview of Most Cited Articles

The number of citations is a key indicator of an article's impact (Akhavan et al., 2016). Recently, bibliometric measures of total citations have been widely used to identify the most-cited articles (Chen & Ho, 2015). The ten most influential articles in disaster and humanitarian aid logistics have been identified through bibliometric analysis based on citation counts. Table 7 displays the articles that are most influential, based on their citation counts.

**Table 7. Most Cited Articles in Disaster & Humanitarian Aid Logistics (2009-2024)**

| Author(s) | Publication Title | Journal | Research Areas | Times Cited |
|---|---|---|---|---|
| Balcik et al. (2010) | Coordination in humanitarian relief chains: Practices, challenges, and opportunities | International Journal of Production Economics | Engineering | 544 |
| Holguín-Veras et al. (2012) | On the unique features of post-disaster humanitarian logistics | Journal of Operations Management | Business & Economics | 359 |
| Holguín-Veras et al. (2013) | On the appropriate objective function for post-disaster humanitarian logistics models | Journal of Operations Management | Business & Economics | 334 |
| Ahmadi-Javid et al. (2017) | A survey of healthcare facility location | Computers & Operations Research | Computer Science | 314 |
| Scholten et al. (2014) | Mitigation processes - antecedents for building supply chain resilience | Supply Chain Management-An International Journal | Business & Economics | 305 |
| Kovács & Spens (2009) | Identifying challenges in humanitarian logistics | International Journal of Physical Distribution & Logistics Management | Business & Economics | 295 |
| Tofighi et al. (2016) | Humanitarian logistics network design under mixed uncertainty | European Journal of Operational Research | Business & Economics | 294 |
| Özdamar & Ertem (2015) | Models, solutions and enabling technologies in humanitarian logistics | European Journal of Operational Research | Business & Economics | 278 |
| Salmerón & Apte (2010) | Stochastic Optimization for Natural Disaster Asset Prepositioning | Production and Operations Management | Engineering | 271 |
| Duran et al. (2011) | Pre-Positioning of Emergency Items for CARE International | Interfaces | Business & Economics | 237 |

The most highly cited paper, authored by Balcik et al. (2010), has garnered 544 citations and explores the coordination within humanitarian relief chains, highlighting essential practices, challenges, and opportunities. Holguín-Veras et al. (2012, 2013) have made significant contributions to post-disaster logistics, focusing on its unique characteristics and appropriate objective functions, with citation counts of 359 and 334, respectively. In addition, Ahmadi-Javid et al. (2017) investigated the strategic locations of healthcare facilities, accumulating 314 citations in computer science. Numerous studies, including those by Scholten et al. (2014), Kovács & Spens (2009), and Tofighi et al. (2016), have addressed resilience, challenges, and network design in humanitarian logistics, each receiving over 290 citations. Özdamar and Ertem (2015) reviewed models and enabling technologies, achieving 278 citations. Meanwhile, Salmerón & Apte (2010) and Duran et al. (2011) focused on stochastic optimization and pre-positioning emergency items, earning 271 and 237 citations, respectively. These research endeavors span business and economics, engineering, and computer science, underscoring the interdisciplinary nature of humanitarian logistics and its critical significance in disaster response and supply chain resilience.

## DISCUSSION

Disaster and humanitarian aid logistics are essential for mitigating the effects of both natural and man-made disasters by ensuring the rapid, efficient delivery of critical resources to impacted communities. Well-organized logistics operations allow the distribution of fundamental supplies, including food, water, medical equipment, and shelter, which are critical for survival and recovery in emergencies. As the frequency of global disasters continues to rise, optimizing logistics within humanitarian efforts becomes increasingly important in alleviating human

suffering and promoting sustainable recovery initiatives. This study visualized and interpreted 1,075 articles on disaster and humanitarian aid logistics using VOSviewer. The significance of color coding and node and cluster sizing in bibliometric analysis using VOSviewer is crucial. This understanding is essential for accurately depicting the structural and thematic organization within a research field. Different colors represent distinct clusters formed through co-occurrence or co-authorship methods, reflecting the conceptual or methodological groupings found in the literature. Conversely, the size of a node indicates the relative frequency or significance of each element—such as a keyword, author, or document—underscoring its influence or centrality within the network. The articles were accessed from the WoS database between 2009 and 2024. The significance of this study lies in its provision of insights into the current status and developmental trajectory of international literature on disaster and humanitarian aid logistics. The findings derived from the analysis are summarized as follows:

The publication trend in this field has steadily risen, with a notable increase in published articles over the past five years, constituting the majority at 52.93%. The spike in studies from 2011 to 2015 can be attributed to significant disasters in regions such as Pakistan, Indonesia, and China, which likely intensified focus on the importance of humanitarian logistics. Additionally, the surge in research during 2020-2021 can be linked to the effects of the COVID-19 pandemic. De Brito et al. (2023) and Rahman et al. (2022) have noted a significant increase in interest in humanitarian logistics during and after the COVID-19 period, leading to a marked acceleration in scientific publications.

All keywords were extracted from the WoS database for evaluation and checked for spelling errors. This database includes three distinct keyword categories: All Keywords, Author Keywords, and KeyWords Plus. According to Zhang (2016), author keywords are an effective tool for identifying the content of studies; consequently, author keywords were chosen to analyze the most frequently used keywords. The most frequently used keywords were Humanitarian Logistics (635) and Disaster Management (78). The visual map displays 11 distinct clusters. No significant differences were found between the most frequently used keywords in this article and those in similar studies, such as those by Khan et al. (2022) and Mermertaş (2024). The findings also indicate that all articles share similar keywords with those published worldwide.

The United States is at the forefront of global research on disaster and humanitarian aid logistics, with 266 publications. Following the United States are China, with 114 publications, and England, which boasts 99. These findings underscore the significant involvement of certain countries in international disaster response, driven by their strong research infrastructure. They also highlight the increasing global attention on effective humanitarian logistics, particularly in regions susceptible to natural disasters and crises (Wassenhove, 2006; Kovács & Spens, 2007). The results suggest that developed countries with robust academic and institutional frameworks lead knowledge production, significantly influencing policies and best practices for global disaster response. On the other hand, countries most susceptible to disasters, particularly those that are less developed, face considerable obstacles related to governance, widespread poverty, inadequate disaster warning systems, infrastructure gaps, insufficient healthcare systems, and the absence of comprehensive disaster management plans (Argumedo-García et al., 2021).

The authors with the most publications and co-authorships are Van Wassenhove and Peter Tatham, with a combined total of 26 publications. Their research primarily concentrates on humanitarian logistics, humanitarian supply chains, and disaster relief efforts. The findings indicate that Van Wassenhove and Peter Tatham exemplify significant collaboration among researchers in this field, reflecting a close cooperative relationship. Additionally, Van Wassenhove and Kovacs Gyongyi are recognized as the most cited researchers, with 1,913 and 1,368 citations, respectively. The United States leads in overall citation count, collecting 9,482 citations, and frequently collaborates with countries such as Brazil, Canada, and China. Moreover, the most cited publication is Balcik et al., with 544 citations. Researchers indicate that citations are crucial in academia, as they are strongly related to visibility (Whipple et al., 2013).

The journals with the highest publication rates in this field include the Journal of Humanitarian Logistics and Supply Chain Management, which accounts for approximately 50% of all publications on the topic. This journal's emphasis on humanitarian operations, disaster response, and supply chain resilience positions it as a key platform for scholars and practitioners tackling complex logistical challenges in emergencies. The following are the Annals of Operations Research and the European Journal of Operational Research, which together represent 18% of total publications. This trend highlights the growing integration of analytical and optimization-based approaches within humanitarian logistics. Additionally, the Emerald Group Publishing's prominence is clearly demonstrated by its leading position, with 314 publications, outpacing Elsevier's 282 articles and Springer Nature's 121 publications. This highlights the significant influence of major academic publishers in disaster and humanitarian aid logistics. Emerald's substantial presence is particularly noteworthy, as it specializes in business, management, and logistics disciplines, making it an essential platform for research in humanitarian logistics. This trend indicates a centralization of academic publishing among a select group of prominent Western-based publishers, which may impact knowledge dissemination, accessibility, and the overall focus of research in disaster logistics and humanitarian studies.

The business and economics category accounts for the largest proportion of research studies on this subject in the WoS database, at 33.95% of total publications. Operations Research and Management Science is followed closely, accounting for 23.91%. It's worth noting that a single publication may be classified under multiple categories. The findings emphasize the increasing recognition of disaster logistics as a crucial component of economic resilience and sustainable business practices. This trend suggests that researchers are increasingly exploring the economic ramifications of humanitarian logistics, effective resource allocation, and the role of businesses in disaster response. Furthermore, the results indicate that scholars are using quantitative methods to address challenges in transportation planning, inventory management, and real-time coordination in disaster scenarios.

The focus on Sustainable Cities and Communities within disaster and humanitarian aid logistics research underscores an increasing commitment to urban resilience, disaster preparedness, and sustainable infrastructure development. As urban areas face escalating threats from natural disasters and humanitarian crises, researchers advocate for strategies that bolster cities' capacities to endure and recover from disruptions, aligning with sustainable development's core principles. Moreover, the emphasis on Good Health and Well-Being underscores the critical role that humanitarian logistics play in delivering medical assistance, ensuring access to healthcare during emergencies, and effectively managing public health crises. The efficiency of supply chains and rapid response mechanisms is crucial for mitigating the health impacts of disasters, especially for vulnerable populations. Additionally, the integration of Responsible Consumption and Production reflects the intersection of sustainability and humanitarian logistics. Research in this area seeks to minimize waste, optimize resource use, and implement circular economy principles in disaster response initiatives (Pascucci, 2021; Besiou et al., 2021; Tuomala et al., 2022).

Finally, Balcik et al. (2010) have garnered a substantial number of citations for their work on coordination within humanitarian relief chains, emphasizing key practices, challenges, and opportunities. Furthermore, Holguín-Veras et al. (2012, 2013) have made significant contributions to post-disaster logistics, focusing on its unique characteristics and appropriate objective functions, and have received considerable citations. These findings underscore the interdisciplinary nature of humanitarian logistics and its vital role in disaster relief and supply chain resilience, spanning business and economics, engineering, and computer science.

## CONCLUSION AND IMPLICATIONS

The primary objective of this study is to present a comprehensive overview of research on disaster and humanitarian aid logistics. A bibliometric analysis was conducted using the WoS database, focusing on contributions related to Disaster and Humanitarian Aid Logistics. The analysis encompassed a sample of 1,075 articles, allowing for the identification of global research

trends in this field from 2009 to 2024. Research in this field has demonstrated a consistent upward trend, highlighted by a notable increase over the past seven years. In 2021, the highest number of publications was recorded. The most frequently utilized keywords encompass Humanitarian Logistics, Disaster Management, and Humanitarian Supply Chain. The primary research areas identified include business and economics, operations research, management science, and engineering, with Business and Economics emerging as a key focal point. The Journal of Humanitarian Logistics and Supply Chain Management is recognized as the leading specialized journal on this subject. The United States is the leading country in total citations and publications in this field. Notably, Tatham Peter and Van Wassenhove have made significant contributions through their impressive publication records. These authors demonstrate a strong commitment to collaboration in their research areas, which encompass humanitarian logistics, disaster logistics, and relief operations. Furthermore, Emerald Group Publishing is recognized as the most specialized publisher within this domain. Key issues related to SDGs encompass Sustainable Cities and Communities, Good Health and Well-Being, and Responsible Consumption and Production.

As highlighted by Argumedo-García et al. (2021), the volume of publications on this topic shows a notable correlation with major global events, such as the Indian Ocean tsunami (2004), Hurricane Katrina (2005), the earthquake in Haiti (2010), and the tsunami in Japan (2011). There was a significant increase in publications during these years. Moreover, an additional surge in publications is anticipated to begin in 2020, largely driven by the global health crisis posed by the COVID-19 pandemic. This crisis has presented serious challenges to the effectiveness of the humanitarian logistics in delivering essential products, protective equipment, and healthcare materials that are not readily available at a local level. This bibliometric study reveals a wide range of trends regarding the concentration of terms over time and across different scientific fields, authors, publishers, journals, countries, SDGs, and topics. These insights aid in planning, designing, and disseminating future research on disaster and humanitarian aid logistics. This study also highlights that developed nations, including the United States, China, England, and France, have significantly contributed to research in this area, as reflected in the WoS database. However, disaster-prone regions and less developed countries should also be included in this discourse. Future research should incorporate additional sources, such as other reputable databases, to broaden the scope of this investigation and improve its findings.

The results are anticipated to yield various advantages for scientific and institutional endeavors. Researchers and managers will have the opportunity to utilize the VOSviewer tool, which provides a thorough database of bibliographic references across multiple scales, thereby enhancing the efficiency and effectiveness of their literature review processes. Moreover, conducting a literature review is a demanding task, and researchers are expected to find the findings of this study, which synthesize existing literature, beneficial. Furthermore, policymakers may gain valuable insights into integrating disaster and humanitarian aid logistics strategies through this comprehensive analysis.

This research acknowledges several limitations. Firstly, it primarily depended on data from a literature search conducted within the WoS Database. A more comprehensive analysis could be achieved by comparing results across various databases. Furthermore, the review was limited to articles indexed in the SSCI, SCI-E, and ESCI. Future studies should consider incorporating articles and other publications, such as editorial material, conference papers, and book reviews, from additional indices to enhance their findings. Additionally, the VOSviewer visual mapping method could be used with other databases, such as SCOPUS, JSTOR, and EBSCOhost, in conjunction with the WoS database. Future research may also benefit from utilizing alternative visual mapping tools, such as Citespace, Pajek, and RStudio, for further analyses and comparisons.

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**Declaration of Generative AI and AI-Assisted Technologies in the Manuscript Preparation Process**

During the preparation of this work, the authors used Grammarly Pro software program to enhance readability and improve language structure. This tool is not used to generate scientific content, analyses, or conclusions. After using Grammarly Pro, the authors reviewed and edited the content as needed and take full responsibility for the final manuscript.