
CHALLENGES IN INTERNATIONAL HUMANITARIAN LOGISTICS: PROBLEM AREAS

Derya Atlay IŞIK¹
Ferhat DINLER²

DOI: <https://doi.org/10.35782/JCPP.2023.4.03>

Abstract: *The objective of this study is to identify crucial problem areas related to the logistics of international humanitarian aid by compiling and analyzing current academic literature. The study findings shed light on significant problem areas that need to be addressed in international humanitarian aid logistics. The study comprises an analysis and compilation study based on a sample of twenty qualitative studies published between 2000 and 2022. In the field of international humanitarian aid logistics, which includes multiple variables and a dynamic structure, we identified the three most emphasized problem areas as well as the fourth factor that had an impact. Our analysis determined that the most crucial issue is the lack of collaboration and coordination among the actors involved. Presenting a focused approach to the challenges encountered in humanitarian logistics, this qualitative compendium study will aid in developing improvement strategies in detail. It will contribute to subsequent studies, particularly the national literature on the subject, and benefit practitioners, particularly those involved in humanitarian aid, and public institutions. This study offers a valuable perspective.*

Keywords: *Natural disaster, humanitarian logistics, problems in humanitarian logistics, stakeholders in natural disasters*

1. Introduction

Humanitarian crises resulting from both man-made and natural disasters, including armed conflicts and social violence (Hotho & Girschik, 2019, p. 202), generate numerous victims who require urgent assistance. Among the many concerns in these situations, logistics operations within the domain of humanitarian aid operations are of paramount importance, as they make up 80% of the total effort (Kovács & Spens, 2007, p.99).

The impact of a disaster is worsened by population growth, climate change, and poverty. Although the capability of society to alleviate the aftermath of natural disasters has improved with industrialization, and disaster prediction has become more precise with

¹ Assoc. Prof. Dr., Muğla Sıtkı Koçman University, Fethiye Faculty of Business Administration, Department of International Trade and Logistics, deryaatlay@mu.edu.tr

² PhD Student, Muğla Sıtkı Koçman University, Social Sciences Institute, Department of International Business and Trade, f_dinler@hotmail.com

technological advances, relief efforts in disaster-stricken areas heavily rely on the training and preparedness of the responding personnel (Salam & Khan, 2020, p. 1457).

The United Nations has estimated that approximately 274 million individuals will require humanitarian aid in the year 2022. This estimate represents an increase of 40 million in comparison to the prior year, indicating a widening of the discrepancy between humanitarian needs and available resources worldwide (European Civil Protection and Humanitarian Aid Operations, 2022). International humanitarian logistics management aims to enhance logistical efficiency when delivering scarce resources to an increasing number of people each year. Considering its crucial role in disaster response operations by connecting disaster preparedness and response (Costa et al., 2012, p. 599), the topic requires both conceptual and empirical research as it continues to be a source of interest and concern (Kovács & Spens, 2009, p. 521). Within the framework of the principle of "better, safer and more efficient aid" stated at the 2016 World Humanitarian Summit in Istanbul, this study aims to pinpoint significant issues in the area of humanitarian aid logistics. The objective is to provide support to humanitarian aid logisticians.

The Fritz Institute, located in San Francisco, provides a definition of humanitarian logistics as "the efficient, cost-effective movement and warehousing of goods and materials from the point of origin to the point of consumption with the purpose of alleviating the suffering of vulnerable individuals. It encompasses the planning, implementation, and management of relevant information and includes functions such as preparation, planning, procurement, transport, storage, monitoring, and customs clearance." More precisely, humanitarian aid logistics entails the management of temporary supply chains under pressure to meet performance targets and address the aftermath of natural or man-made disasters (Chandes & Paché, 2010, p. 321).

International humanitarian aid logistics exhibits distinctive features that are widely acknowledged (refer to Table-1), and its research field is relatively nascent. Academic literature on humanitarian logistics often concentrates on disaster relief preparation. However, it has potential significance for business logistics and commercial supply chains as it relates directly to managing volatile environments (Kovács & Spens, 2007, p. 110).

Table 1: Characteristics of International Humanitarian Aid Logistics

Purpose	To alleviate the suffering of people in need
Stakeholders	There are stakeholders without links. Usually consists of governments and government agencies and humanitarian organizations
Basic Qualities	Preparedness, emergency response, rebuilding, diversity of supply, high supply, irregular and uncertain demand
Supply Chain Philosophy	The push strategy is implemented.
Transportation	There is uncertainty in the supply of food and medical supplies due to inadequate infrastructure.
Time	Lack of timely logistics can lead to human casualties
Information Flow	As disasters require immediate response, creating a supply chain requires detailed knowledge and planning.
Supplier Structure	Sometimes undesirable suppliers are employed because the options are limited.
Control	There is a lack of control over the operation.

Source: Kovács & Spens, 2007, p. 108

The paper is structured into three main sections. The methodology and literature section outlines the study's principles and sample creation. The findings section analyses and identifies the most critical problem areas highlighted in the sample. Lastly, the conclusion section presents potential solutions to the problems and suggests avenues for future research.

2. Methodology and Literature Review

Literature reviews and methodological studies hold significant importance in academic research. They build on existing literature, gathering useful information about the subject, while keeping academics informed of recent developments. Furthermore, these reviews provide new interpretations by bringing together data from various perspectives (Herdman, 2006, p. 2). Systematic reviews conduct an analysis of academic research studies and allow for the evaluation of literature to identify its limitations and strengths (Çinar, 2021, p. 310).

The literature review was implemented in three steps, including sorting, classification, and analysis stages. A literature review was conducted using keywords and phrases including "humanitarian logistics", "relief supply chains", and "humanitarian disaster logistics management". In addition, UN official websites were examined. The search was carried out across several databases including Google Scholar, Taylor & Francis, Springer Link, Science Direct, Emerald Insight, and Turkish Thesis Centre. A literature review was conducted on humanitarian aid logistics from 2000 to 2022, with previous studies excluded from the scope. The subject's dynamic structure and rapidly evolving concepts were taken into account during the review process.

In the second stage, 67 studies were sorted and evaluated for their focus on issues encountered in humanitarian aid logistics, out of hundreds of results obtained from databases. Twenty studies were selected based on their relevance to the subject matter. A sample was formed by excluding other studies.

In the third stage, the twenty selected studies were comprehensively examined, and their data and content were compiled for analysis. Table-2 provides essential information on the academic articles. To highlight the effectiveness of the reviewed articles, the number of citations was determined using the Dimensions data server.

Table 2: Studies Reviewed by Authors

R.N.	Year	Paper	Author	Nation	Publisher	Natural Disaster Type	Natural Disaster Region	Category (Descriptive, Explanatory, Exploratory survey)	Methodology (Case, Theory-oriented, Interview)	Number of Citations	Most Important Issue Identified
1	2006	Humanitarian aid logistics: supply chain management in high gear	L N Van Wassenhove	France	Journal of the Operational Research Society	Multiple	Multiple	Descriptive	Multiple Case Study	992	Supply Chain Management and Procurement problems
2	2007	Humanitarian logistics in disaster relief operations	Gyongyi Kovacs ve Karen M. Spens	Finland	International Journal of Physical Distribution & Logistics Management	None	None	Explanatory	Theory-oriented	690	Cooperation and Coordination Issues Among Stakeholders
3	2008	Facility location in humanitarian relief	B. Balciik and B. M. Beamon	USA	International Journal of Logistics: Research and Applications	None	None	Exploratory survey	Theory-oriented	724	Deployment problem of disaster relief logistics
4	2009	Investigating humanitarian logistics issues: from operations management to strategic action	Je'ro'me Chandes ve Gilles Pache	France	Journal of Manufacturing Technology Management	Earthquake	Peru (August 2007)	Exploratory survey	Case Study	98	Shipping and Distribution Issues
5	2009	Identifying challenges in humanitarian logistics	Gyongyi Kovacs ve Karen Spens	Finland	International Journal of Physical Distribution & Logistics Management	Earthquake	Gana, (2007)	Exploratory survey	Case Study	310	Uncertainty of the Logistics Environment
6	2010	Transforming humanitarian logistics: the journey to supply network management	Peter H. Tatham ve Stephen J. Pettit	England	International Journal of Physical Distribution & Logistics Management	None	None	Descriptive	Theory-oriented	99	Supply Chain Management and Procurement Issues
7	2010	Coordination in humanitarian relief chains: Practices, challenges and opportunities	Burcu Balciik, Benita M. Beamon, Caroline C.Krejci, Kyle M. Muramatsu, Magaly Ramirez	USA	Int. J. Production Economics	None	None	Explanatory	Theory-oriented	576	Cooperation and Coordination Issues Among Stakeholders

R.N.	Year	Paper	Author	Nation	Publisher	Natural Disaster Type	Natural Disaster Region	Category (Descriptive, Explanatory, Exploratory survey)	Methodology (Case, Theory-oriented, Interview)	Number of Citations	Most Important Issue Identified
8	2012	Supply Chains in Humanitarian Operations: Cases and Analysis	Sergio Ricardo Argollo da Costaa, Vânia Barcellos Gouvêa Camposb, Renata Albergaria de Mello Bandeirab	Brazil	Procedia - Social and Behavioral Sciences	Multiple	India Pakistan Japan	Descriptive	Multiple Case Study	56	Shipping and Distribution Issues
9	2012	Comparative performance of alternative humanitarian logistic structures after the Port-au-Prince earthquake: ACEs, PIEs, and CANS	José Holguín-Veras, Miguel Jaller, Tricia Wachtendorf	USA	Transportation Research	Earthquake	Haiti (January 2010)	Exploratory survey	Case Study	69	Shipping and Distribution Issues
10	2012	Employing a systems-based perspective to the identification of interrelationship within humanitarian logistics	Graham Heaslip, Amir M. Sharif, Abraham Althonayan	England	Int. J. Production Economics	None	None	Descriptive	Theory-oriented	83	Cooperation and Coordination Issues Among Stakeholders
11	2012	On the unique features of post-disaster humanitarian logistics	José Holguín-Veras, M. Jaller, L.N.V. Wassenhove, N. Pérez, T. Wachtendorf	USA	Journal of Operations Management	None	None	Explanatory	Multiple Case Study	361	Uncertainty of the Logistics Environment
12	2012	Coordination in humanitarian relief chains: chain coordinators	P. Akhtar, N.E. Marr, E.V. Garnevskaa	New Zealand	Journal of Humanitarian Logistics and Supply Chain Management	Earthquake	South Asia (2005)	Explanatory	Case Study	119	Supply Chain Management and Procurement Issues
13	2014	Rights and obligations in international humanitarian assistance	George Kent	USA	Disaster Prevention and Management	None	None	Explanatory	Theory-oriented	7	Legal vacuum in humanitarian aid logistics

R.N.	Year	Paper	Author	Nation	Publisher	Natural Disaster Type	Natural Disaster Region	Category (Descriptive, Explanatory, Exploratory survey)	Methodology (Case, Theory-oriented, Interview)	Number of Citations	Most Important Issue Identified
14	2015	Segmenting critical factors for enhancing the use of IT in humanitarian supply chain management	Gaurav Kabraa ve A. Rameshb	India	Procedia - Social and Behavioral Sciences	None	None	Exploratory survey	Theory-oriented	23	Inadequate use of information technologies
15	2015	Identification and prioritization of coordination barriers in humanitarian supply chain management	Gaurav Kabra, A.Ramesh, Kaur Arshinder	India	International Journal of Disaster Risk Reduction	-	India (2015)	Exploratory survey	Case Study	94	Cooperation and Coordination Issues Among Stakeholders
16	2019	Synchronized Humanitarian, Military and Commercial Logistics: An Evolving Synergistic Partnership	Pablo Yuste, J. Campbell, D. Canyon, Mark Childers ve Benjamin J. Ryan	USA	Safety	None	None	Descriptive	Theory-oriented	7	Cooperation and Coordination Issues Among Stakeholders
17	2019	Corporate engagement in humanitarian action Concepts, challenges, and areas for international business research	Jasper Hotho ve Verena Girschik	Denmark	Critical Perspectives on International Business	None	None	Explanatory	Theory-oriented	14	Cooperation and Coordination Issues Among Stakeholders
18	2020	Lessons from the humanitarian disaster logistics management	Mohammad Asif Salam veSami A. Khan	Saudi Arabia	Benchmarking An International Journal	Earthquake	Haiti (January 2010)	Exploratory survey	Case Study	17	Cooperation and Coordination Issues Among Stakeholders
19	2021	Identifying Challenges and Improvement Approaches for More Efficient Procurement Coordination in Relief Supply Chains	ChristianWankmüller ve Gerald Reiner	Austria	Sustainability Journal	None	None	Exploratory survey	Interview	4	Supply Chain Management and Procurement Issues

R.N.	Year	Paper	Author	Nation	Publisher	Natural Disaster Type	Natural Disaster Region	Category (Descriptive, Explanatory, Exploratory survey)	Methodology (Case, Theory-oriented, Interview)	Number of Citations	Most Important Issue Identified
20	2021	Localisation of logistics preparedness in international humanitarian organisations	L. Frennesson, J. Kembro, H. de Vries Luk V. Wassenhoveve M. Jahre	Switzerland-Netherlands	Journal of Humanitarian Logistics and Supply Chain Management	None	None	Exploratory survey	Interview	10	Logistics deployment and resistance to change

3. Findings

The twenty scientific studies surveyed were divided into three categories, comprising nine exploratory studies, five descriptive studies, and six explanatory studies. Of these, nine were theory-oriented, nine were case studies, and two were conducted using the interview method.

The studies revealed a prominent issue of "lack of cooperation and coordination among stakeholders" as the primary concern for analysis. The focal point of seven studies, accounting for 35% of the total sample, is this particular problem area. The second most vital issue, concerning supply chain management and purchasing problems, has been thoroughly investigated in four out of the 20 studies, representing 20% of the sample. With regards to the third most significant problem, transportation and distribution issues, this constitutes 15% of the sample, as determined by Table 3.

Table 3: Distribution of Studies by Focused Problem

PROBLEM	STUDIES (According to Table-2 Ranking)	TOTAL
Lack of Stakeholder Cooperation and Coordination	2, 7, 10, 15, 16, 17, 18	7
Supply chain management and Procurement Issues	1, 6, 12, 19	4
Shipping and Distribution Problems	4, 8, 9	3
Uncertainty of the Logistics Environment	5, 11	2
Logistics Deployment	3, 20	2
Information Technologies and Lack of Information Sharing	14	1
Legal Issues	13	1

Nine of the analysed studies were carried out by scholars from different European countries, six by academics from the United States, and five by scholars from other countries. Based on this finding, it can be inferred that research on the topic is

predominantly conducted in Europe. This suggests that Western societies are taking the lead in addressing the problems encountered in humanitarian aid logistics, and that further scientific approaches need to be developed.

4. Problems in International Humanitarian Aid Logistics

Humanitarian logistics encompasses diverse activities including mitigation, preparedness, response and recovery during any phase of emergency management (Holguín-Veras et al., 2012, p. 496).

Humanitarian organisations worldwide encounter several intricate challenges in their disaster response efforts (Vaillancourt, 2016, p. 64). Regrettably, they are lagging behind the private sector by almost 15 years, which early on acknowledged the significance of utilising supply chains (Van Wassenhove, 2006, p. 476). Despite the tendency of humanity to save others from the plight of others and the application of commercial logistics experience to humanitarian aid, problems are experienced due to the unique differences of humanitarian aid logistics, so the international community is trying to improve the process of providing and distributing aid in a coordinated and integrated manner (Salam & Khan, 2020, p. 1458).

A supply chain founded on long-term commitments between stakeholders sharing common commercial goals is unsuitable for humanitarian logistics (Salam & Khan, 2020, p.1459). Moreover, there are several supplementary obstacles to overcome when compared to commercial logistics. These include physical challenges in reaching beneficiaries due to severe transport infrastructure deterioration (Hotho & Girschik, 2019, p. 203; Tatham & Spens, 2011, p. 10).

- There is inadequate time to identify necessary materials.
- The communication infrastructure lacks reliability, hindering information flow.
- Inter-agency partnerships in standards, strategy, and processes are lacking.
- There is resistance to organizational learning.
- Safety concerns in the relief area, particularly during man-made disasters.
- The duration of logistic needs and the uncertainty of continuity status.

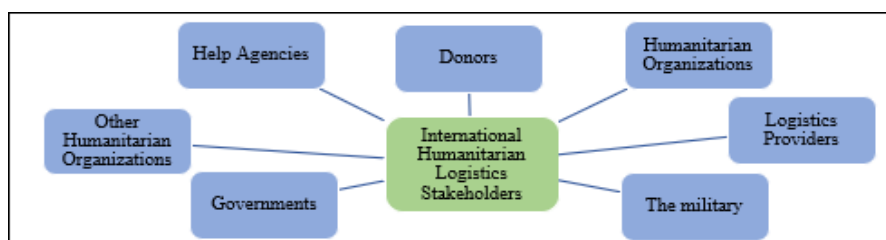
Humanitarian aid logistics is a means of delivering direct support to communities affected by disasters and to those assisting them. The aim is to enhance the delivery process of necessary goods to save lives and restore damaged infrastructure (Chandes & Paché, 2010, p. 322).

The challenges of humanitarian logistics include short delivery times, unpredictable demand, high risks of timely deliveries, and limited resources (Kovács & Spens, 2009, p. 507). This study identifies and discusses the top three issues found in literature, while collecting other problems under a separate section.

4.1. Cooperation and Coordination Issues Among Stakeholders

The allocation of scarce resources presents a significant challenge, especially when communication infrastructures have completely collapsed. Humanitarian logistics demands a vision that surpasses traditional logistics principles. The reason being that it must organize different actors who lack partnerships between stakeholder sectors and must share processes and distribution channels to work together effectively. The Haiti earthquake experience reveals that aid workers possess inadequate awareness about pre-disaster arrangements. Regrettably, organizations concentrate on delivering aid instead of conducting preparations during disasters (Salam & Khan, 2020, pp. 1465-1468). In this context, the foremost challenge highlighted in the international humanitarian aid logistics literature is the coordination of logistics activities (Kovács & Spens, 2009, p. 506) and the difficulties in ensuring collaboration between aid organisations (Balcik et al., 2010, p. 22). Other factors, including human resource planning, resource allocation, inter-agency relationships, and information exchange between stakeholders (refer to Figure 1), have an impact on the effectiveness or failure of coordination processes (Wankmüller & Reiner, 2021, p. 6).

Figure 1: International Humanitarian Logistics Stakeholders



Source: Kovács & Spens, 2007, p. 106

As a participant in humanitarian logistics, the military is involved in many of the same logistic endeavours related to aid. Military logistics play a significant role in situations of natural disasters, as their abilities in heavy transportation, communication, and security are unmatched. Notwithstanding the highly effective and advantageous short-term impact of military actors on the ground, incongruities in cost, appropriateness and comprehension between military and humanitarian aid actors present difficulties for the continuation of aid. Military logistics is particularly effective for first responders, albeit costly, and thus, its sustainability remains challenging. Furthermore, there is a lack of standardization between civil and military logistics (Yuste et al., 2019, p. 3). Military aid operations are generally coordinated from a specific coordination centre. However, the management of humanitarian aid operations is inconsistent, as aid is distributed through numerous centres of various aid organisations (Kovács & Spens, 2007, p. 103).

Insufficient and inefficient coordination is evident through low levels of information sharing and poor cooperation among non-governmental organisations (NGOs), often resulting in coordination errors. After the 2004 tsunami in Bandar Aceh, over 72 coordination meetings took place per week and 170 distinct organisations participated in

post-tsunami sanitation meetings. Nevertheless, the outcome did not meet expectations as meetings transformed into information exchange tools rather than a means of attaining integrated management (P. H. Tatham & Pettit, 2010, p. 615). Coordination issues stem from inadequate communication between NGOs and the lack of mutual trust and respect, exacerbated by challenging working conditions. Such issues were evident during the 2004 Indian Ocean tsunami, hurricane Katrina, the 2010 Haiti earthquake, and the ongoing COVID-19 epidemic. Studies have also revealed that resources in the aid chain are not being used effectively, leading to some extent of wastage, and aid delivery is frequently delayed. These coordination difficulties often result in duplicated efforts and excess relief supplies being sent to a specific disaster area, whose consequences, such as ineffective aid distribution, increased casualties and higher costs for survivors receiving deliveries, are often considered catastrophic in the aftermath of disasters. These coordination difficulties often result in duplicated efforts and excess relief supplies being sent to a specific disaster area, whose consequences, such as ineffective aid distribution, increased casualties and higher costs for survivors receiving deliveries, are often considered catastrophic in the aftermath of disasters. (Wankmüller & Reiner, 2021, p. 2). In brief, the challenges of coordination include cultural conflicts, time loss in coordination meetings, lack of cooperation among state officials, insufficient skilled workers, and language barriers (Akhtar et al., 2012, p. 98).

Another challenge in institutional engagement in humanitarian action is to encourage businesses to partake in the delivery of humanitarian aid and to guarantee their continued involvement at various stages of the crisis. Traditional humanitarian actors operate by adhering strictly to the principles of humanity, impartiality and independence. However, when non-humanitarian actors engage in humanitarian activities, adherence to these principles cannot be guaranteed. Firms may be unaware of, or choose not to comply with, these principles, particularly when they clash with their commercial interests or motivations (Hotho & Girschik, 2019, p. 211-212).

Thus, four main groups of factors hindering organizational cooperation can be identified. These include: the perception of logistics as a core organizational competency; cultural differences and mutual distrust; lack of transparency regarding potential and current benefits; and insufficient assistance capacities (Heaslip et al., 2012, p. 390).

4.2. Supply Chain Management and Procurement Issues

The humanitarian aid supply chain may be defined as the process of efficiently planning, implementing, and controlling the flow and storage of goods, information, and materials, from the starting point to the point of consumption, at a cost-effective rate. This is done to satisfy the needs of the end beneficiary (Lewin et al., 2018, p. 519).

The variations in the forms and features of humanitarian aid logistics for each disaster (earthquake, flood, fire, internal conflicts, etc.) and the specific conditions of each event determine the required special supplies. While basic human needs such as eating and drinking remain identical, the distinct medication, shelter, infrastructure necessities, transportation opportunities, and constraints associated with different geographies make advance preparation a challenge. Each event requires unique planning criteria.

The importance of preparedness has been underlined by UN member states through the Sendai Disaster Risk Reduction 2015-2030 Framework, which aims to decrease disaster risk and minimize the harmful impacts of disasters. This process encompasses various actions such as evaluating requirements, acquiring resources, storing and delivering items, managing waste and gauging effectiveness to mitigate the distress of individuals in need (Frennesson et al., 2020, p. 86).

The supply chain in humanitarian logistics can be viewed as temporary chains established for specific operations (Jahre et al., 2009, p.1009). This distinguishes it from commercial supply chain management. Commercial supply chains are more stable and operate with mostly predictable supply patterns. Conversely, humanitarian aid logistics face highly uncertain demand which makes it challenging to operate. Trade sourcing involves trade items that provide advantages for customers who wish to purchase the goods (pull strategy). On the other hand, the humanitarian supply chain oversees resources and products such as evacuation vehicles and shelter that cater to fulfilling basic human needs. The humanitarian aid supply network goes beyond "humanitarian" organizations (donors, aid organisations, NGOs, etc.) and operates with distinct dynamics. In commercial procurement, stakeholders generally include factories, distributors, retail stores, and customers. In contrast, in humanitarian aid procurement, key stakeholders involve international and local NGOs, governments, charities, private sector companies, and beneficiaries (Wankmüller & Reiner, 2021, p. 5), (Kovács & Spens, 2009, p. 512). It is important to note that these designations may be subject to contextual variations.

Charities have evolving agendas and strategic objectives and are responsible to their donors. They prioritize front-end procedures, such as water or vaccine delivery, over back-end procedures, like establishing efficient supply chain networks. Developing effective supply chain management is challenging due to the intricacy of interorganizational relationships and connections with donors (Salam & Khan, 2020, p. 1459). Furthermore, within the realm of humanitarian aid logistics, cash donations and non-monetary goods and services can be incorporated into the supply chain either intentionally or inadvertently procured from suppliers (Falasca & Zobel, 2011, p.154).

Humanitarian crises differ in duration. While some, like the chronic famine that hit Somalia in 2017, may persist for a long time, others, such as the tsunami that hit Sulawesi island in 2018, are short-lived (Hotho & Girschik, 2019, p. 203). However, prolonging supply times can impede the supply chain's efficacy (Negero, 2018, p. 97). Furthermore, Kabra et al. (2015, p. 135) assert that the foremost concern in the disaster supply chain is the actors' technological capabilities, due to the lack of strategic planning and unequal opportunities in information technologies.

In the research carried out by Kabra et al. (2015), administrative, technological, cultural, human, and organizational barriers are presented as the fundamental challenges in streamlining the coordination of the humanitarian aid supply chain. In a recent study conducted by (Wankmüller & Reiner, 2021), issues related to joint purchasing were classified as follows: wasteful resource use (overestimation of needs), insufficient transparency in information sharing, reluctance to change (procurement coordinators tend to resist improvement practices and exhibit behaviour patterns averse to change), inadequate information exchange, and disparate approaches towards preparedness (pre-

disaster procurement protocols vary across NGOs). Some organisations have prearranged agreements with their suppliers to expedite the procurement process when necessary. Some organizations do not adequately prepare for relief supply procurement. Additionally, there are varying approaches to needs assessment, with some institutions deeming it unnecessary and failing to hold important coordination meetings. These organizations independently conduct demand assessment. Furthermore, NGOs compete for financial resources by striving to maximize their media exposure. Another factor contributing to competition amongst civil society organizations (CSOs) is the absence of incentive systems to encourage organizations to collaborate instead of competing with each other. Additionally, ineffective resource management and the manipulation of prices can further exacerbate this issue. High-intensity disasters often call for the mobilization of numerous organizations of various sizes to provide relief operations. Smaller NGOs depend on local producers if they cannot source from global suppliers or lack knowledge of their own resources. The media's impact is crucial in the funding performance of humanitarian organizations. During recent humanitarian responses, the media has been both beneficial and detrimental. Complex bureaucratic obstacles and lack of transparency in supplier selection pose significant risks to customers and beneficiaries in disaster areas, as delivered products may not meet appropriate standards.

The coordination of urgently required relief supplies presents a complex challenge. Decentralised task coordination tends to result in duplicated efforts and the delivery of inappropriate supplies to individual disaster areas. A study conducted in 2021 highlighted the significant challenges involved in procurement coordination, including a lack of cooperation incentives, poor communication, unclear power division, and non-compliance with standards and regulations. The findings from interviews with business experts indicate that integrating social media, increasing purchasing flexibility and improving coordination can assist NGOs in the development of purchasing activities (Wankmüller & Reiner, 2021, p. 2).

4.3. Transportation and Distribution Issues

Transport and distribution play significant roles in disaster relief operations. Delivering aid to the final destination following a disaster can prove to be a difficult task for relief organisations (Balcik et al., 2010, p. 24). After a natural disaster, attempts are made to provide logistics through numerous distribution points spread over a wide area. Debris often damages delivery vehicles and infrastructure, leading to significant uncertainty about the state of the transportation network, which can also be congested (Holguín-Veras et al., 2012, p. 497).

Establishing a local network is crucial for delivering appropriate resources to the necessary recipients, and an effective transportation link with the network and relevant stakeholders is pivotal for accomplishing successful disaster management (Salam & Khan, 2020, p. 1462). Furthermore, the diminishing authority of the local government in the region, the destruction of infrastructure, and the inability of local officials to perform their duties due to stress and panic hinder the delivery of relief supplies to the end user (the needy) (Pateman et al., 2013, p. 90).

Insufficient logistics coordination among NGOs may result in a surplus of inert materials, including unwanted donations and materials, which in turn can obstruct the operations of airports and warehouses (Heaslip et al., 2012, p. 379). Consequently, this adversely affects the direct distribution process. Moreover, an absence of consistent labeling protocols for materials further complicates aid distribution to various regions (Kovács & Spens, 2007, p. 104).

Transport crises occurred during the response to the 2010 flood in Pakistan. The delivery of aid was impeded due to transportation bottlenecks, limited access to affected regions, and scarce vehicles (Gralla & Goentzel, 2018, p. 436). The South Asian Earthquake in 2005 presents another illustration, whereby distribution expenses escalated because of the shortage of time, high demand, and danger, along with increased truck and vehicle fees (Akhtar et al., 2012, p. 95). Following the Haiti earthquake, a widespread global aid network was established with thousands of planes and ships delivering aid and tens of thousands of volunteers assisting with the response. Despite these efforts, significant supply chain disturbances occurred due to damage inflicted upon crucial transport infrastructure including the Port-au-Prince airport and the connecting road to the Dominican Republic. The failure of certain agencies in tracking down the lorries required to distribute relief supplies sparked a "lorry crisis". This resulted in lorry loads being labelled as one of the foremost three priorities for landing at the airport and necessitated urgent appeals to international donors by the Dominican Republic Government for lorries. Moreover, the establishment of an assortment of distribution points and the provision of security to safeguard convoys have encountered substantial setbacks. A significant quantity of aid has amassed at the airport in Port-au-Prince, which is being distributed to aid camps via aerial and airborne drop-offs due to the urgent situation. The foremost reasons for the issues encountered after the earthquake were the unavailability of crucial supplies for the survivors and the absence of a local transportation network, impeding delivery. This catastrophe has highlighted the importance of integrating collaborative aid links as an official partner in relief efforts to ensure healthy humanitarian logistics (Holguín-Veras et al., 2012, p. 1623-1638). The lessons learned from this earthquake distinctly demonstrate that the negative impact of infrastructure and transportation systems caused disruptions to disaster relief transportation. Logisticians must be mindful of the strong possibility of encountering such situations.

4.4. Other Issues

In addition to the aforementioned challenges, several difficulties fall under one grouping that contributes to the complexity of international humanitarian aid logistics. The foremost of these pertains to the legal dimension of humanitarian aid operations, which though present, remains opaque. Clearing the obligations and privileges of various parties concerning international humanitarian aid are necessary steps towards greater clarity. In respect of donor rights and the entitlement of those in need to receive aid, numerous states stress their ability to offer international humanitarian aid but are disinclined to accept a duty to do so (Kent, 2014, pp. 214-221). In brief, there is a dearth of unambiguous and adept global legislative frameworks that set out the scope of humanitarian aid operations.

Additional complexities surrounding the flow of resources can arise from indirect issues, including customs. While it is necessary to develop common customs procedures for all humanitarian organizations, it should be noted that challenges in customs procedures indicate a lack of disaster preparedness in countries (Kovács & Spens, 2009, p. 522).

Additionally, differences in culture, education, and objectives among aid actors pose a problem. International providers, stakeholders, and aid recipients hold diverse cultures and values, which may lead to disruptions. It is important to consider the intra-organisational challenges faced by most NGOs, as staff members, including volunteers and paid employees, must work in tandem. Different levels of expertise and motivation within different groups of staff can result in various predicaments (Wankmüller & Reiner, 2021, p. 6).

Additionally, limitations on aid may arise due to a country's national security concerns or defense mechanisms. Although certain governments receive international aid, they may refuse assistance to protect their sovereignty. These countries may fear that humanitarian intervention could be used for political purposes (Kent, 2014, p. 219).

While information technologies (IT) are vital in humanitarian aid logistics, many researchers overlook their potential benefits and efficiency. In recent years, the implementation of information technology (IT) has proved to be an effective approach to enhance the overall performance of the humanitarian supply chain.

The logistics managers should be mindful of security issues as well. In certain conflict zones, like war-torn regions, insurgent groups may seek to block the delivery of aid and other crucial supplies. Looting can occur after natural disasters, and vehicles can often be stopped and redirected from their intended destination (Kovács & Spens, 2007, p. 107). The risk is not limited to the material. Logisticians dealing with man-made disasters, including those involving armed conflict and political crises, may face abductions and murders of humanitarian aid workers, in addition to security challenges related to material.

Furthermore, a lack of qualified personnel is an indirect factor that hampers disaster logistics (Kovács & Spens, 2009, p. 510). Additional training is essential for local transport service providers, as well as for those involved in logistics for local humanitarian initiatives or humanitarian logistics more broadly (Kovács & Spens, 2009, p. 522).

5. Conclusion

5.1. Suggestions for Logistics Problems

In summary, the effectiveness of humanitarian logistics is contingent upon various factors including the location and type of disaster, number and severity of casualties, condition of local infrastructure, and availability of transportation resources. Chandes and Paché (2010, p. 323) affirm these criteria. Furthermore, research has shown that executing strategies is comparatively more challenging than devising them in this context. Nonprofits and other stakeholder groups face a high level of complexity while dealing with financial, political, and social pressures. According to literature, several obstacles

hinder successful implementation of strategies (Frennesson et al., 2020, p. 87). The identification of problems plays a crucial role in focusing on their resolution.

The primary objective of humanitarian logistics is to establish connections and relationships. Government agencies, the military, NGOs, local communities, and victims ought to collaborate to produce solutions customised to disaster shock (Salam & Khan, 2020, p. 1455). Augmenting the establishment of local networks and aligning them with long-term and short-term humanitarian preparedness scenarios could significantly enhance future responses. Continuous investment in strategic coordination and knowledge management efforts is crucial to achieving better coordination outcomes (Lewin et al., 2018, p. 526). Humanitarian logisticians should be aware of several challenges, ranging from inadequate logistics infrastructure management to coordination and technological barriers, as well as the fragmented state of knowledge management and people's unwillingness to share information (Salam & Khan, 2020, pp. 1456-1458).

Developing standard templates and systems is crucial to enhance humanitarian interoperability. Despite significant efforts to facilitate online information sharing and the development of a Logistics Operational Guide in 2010, there are still numerous variations of templates for conducting needs assessment and tracking ordered items (Kovács & Spens, 2011, p. 35). The implementation of standardized terminology in the humanitarian sector can enhance management by promoting transparency, integration, data sharing, and harmonization (Lewin et al., 2018, p. 525).

Rather than waiting passively for a crisis to happen anywhere in the world to prompt humanitarian aid operations, it can be beneficial to take a proactive approach by anticipating and mobilising resources, both tangible and intangible. Furthermore, the procurement and delivery of adequate relief materials from local and/or international suppliers post-disaster is often a time-consuming and costly process. Aid agencies undertake preparedness activities to enhance their logistical capabilities when responding to emergencies. An effective strategy deployed is the pre-positioning of critical aid materials in strategic locations worldwide (Balcik & Beamon, 2008, p.102). This strategy greatly simplifies the fulfillment of demand in the initial hours following a disaster, as the first demand can be met expeditiously with pre-positioned aid items (Wankmüller & Reiner, 2021, p.5).

In general, the response to a disaster depends on its level of predictability, while specific types of disasters are linked to particular geographical regions (Kovács & Spens, 2009, p. 509). It is possible to predict geographically the likelihood of earthquakes near the existing major fault line and their potential severity as well as the intensity of precipitation. To ensure preparedness, it is imperative to make an informed decision regarding the location of the "strategic centre" (or "logistics centre") to be established in high-risk regions (Chandes & Paché, 2010, p. 327). The World Food Programme (WFP) has strategically pre-positioned disaster relief stockpiles at six United Nations Humanitarian Response Depots located in a global network situated in Ghana, the United Arab Emirates, Malaysia, Panama, Italy, and Spain. Major warehouses managed by the WFP are strategically located at key transportation hubs for road, rail, air, and sea freight. This ensures that relief supplies can be transported within 24 to 48 hours within the region

(Yuste et al., 2019, p. 7-8). Figure-2 displays the exact locations of these United Nations warehouses.

Figure 2: United Nations Humanitarian Response Depot-UNHRD



Source: United Nations Humanitarian Response Depot-UNHRD

A significant majority concurs on the necessity of dispersing logistics readiness, whereas only a minor proportion encourages centralisation (Frennesson et al., 2020, p. 97). The notion underlying this belief is that creating a more widespread logistics network and warehouse system will enhance response speed and ability.

Pursuing commercially effective solutions may also be considered and implemented, if suitable. For instance, numerous commercial enterprises employ third- or fourth-party logistics providers (3PL/4PL). In principle, such an approach may be considered for use in the humanitarian sector. Following the 2004 tsunami, a logistic agglomeration study was performed to remove redundancies amongst UN agencies (P. H. Tatham & Pettit, 2010, p. 616).

Often, utilising military capabilities in disaster logistics saves lives. After the earthquake in Haiti, the United States Air Force operating portable air traffic control equipment arrived the day after, enabling aid planes to take off and land due to the functional runway (Holguín-Veras et al., 2012, p. 1626). Joint workshops and exercises in areas of mutual interest should be encouraged among military and civilian personnel to ensure mutual learning from divergent perspectives (Heaslip et al., 2012, p. 379).

It may appear unconventional to utilise a military approach to addressing issues, but considering the nature of an emergency situation, there are evident similarities between humanitarian assistance and military logistical operations. The parallels between a war-stricken environment and a disaster-struck one can be delineated by "uncertain events in the future, significant harm inflicted on physical infrastructure, a substantial number of fatalities, casualties, and/or psychologically distressed individuals, and an intense curiosity from the global media, the ramifications of which cannot be precisely anticipated" (P. Tatham & Spens, 2011, p. 15).

5.2. Limitations and Suggestions for Future Studies

Numerous challenges identified in our study have a substantial impact on the logistics of providing humanitarian aid, with three crucial issues distinguished within the literature. These being, firstly, the inadequate cooperation and coordination amongst stakeholders; secondly, supply chain management and procurement concerns; and thirdly, transportation and distribution complications.

Further research is necessary to discover new and inventive approaches in developing intricate coordination mechanisms, relationships, and contracts in the humanitarian supply chain. This study highlights problem areas within international humanitarian aid logistics, providing insight for future studies focused on solving these issues.

The study emphasises the need to prioritise particular obstacles in future research. Though predominantly English literature was reviewed, local findings and studies in disaster-prone countries were unfortunately excluded. Only studies addressing accessible concerns within humanitarian aid logistics were included in the sample. The topic was discussed generally, however, future studies will benefit from focusing on a singular problem area and incorporating a variety of languages.

More extensive analysis and evaluation of natural disasters will provide a more precise understanding of institutional solutions. We anticipate that through the experience gained, the intersection of practices, the sharing and development of common solutions, and the scientific analysis of these studies, the identification of key points will be made possible.

Authorship

Equal contribution from both authors.

Acknowledgements

N/A

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Declaration of conflicting interests

The authors declare no conflicting interests.

References

- Akhtar, P., Marr, N. E., & Garnevskaya, E. V. (2012). Coordination in humanitarian relief chains: Chain coordinators. *Journal of Humanitarian Logistics and Supply Chain Management*, 2(1), 85-103. <https://doi.org/10.1108/20426741211226019>
- Balcik, B., & Beamon, B. M. (2008). Facility location in humanitarian relief. *International Journal of Logistics Research and Applications*, 11(2), 101-121. <https://doi.org/10.1080/13675560701561789>
- Balcik, B., Beamon, B. M., Krejci, C. C., Muramatsu, K. M., & Ramirez, M. (2010). Coordination in humanitarian relief chains: Practices, challenges and opportunities. *International Journal of Production Economics*, 126(1), 22-34. <https://doi.org/10.1016/j.ijpe.2009.09.008>
- Chandes, J., & Paché, G. (2010). Investigating humanitarian logistics issues: From operations management to strategic action. *Journal of Manufacturing Technology Management*, 21(3), 320-340. <https://doi.org/10.1108/17410381011024313>
- Costa, S. R. A. da, Campos, V. B. G., & Bandeira, R. A. de M. (2012). Supply Chains in Humanitarian Operations: Cases and Analysis. *Procedia - Social and Behavioral Sciences*, 54, 598-607. <https://doi.org/10.1016/j.sbspro.2012.09.777>
- Çınar, N. (2021). İyi Bir Sistematik Derleme Nasıl Yazılmalı? *Online Türk Sağlık Bilimleri Dergisi*. <https://doi.org/10.26453/otjhs.888569>
- European Civil Protection and Humanitarian Aid Operations. (2022, Kasım 26). https://civil-protection-humanitarian-aid.ec.europa.eu/what/humanitarian-aid/capacity-building_en
- Falasca, M., & Zobel, C. W. (2011). A two-stage procurement model for humanitarian relief supply chains. *Journal of Humanitarian Logistics and Supply Chain Management*, 1(2), 151-169. <https://doi.org/10.1108/20426741111188329>
- Frennesson, L., Kembro, J., de Vries, H., Van Wassenhove, L., & Jahre, M. (2020). Localisation of logistics preparedness in international humanitarian organisations. *Journal of Humanitarian Logistics and Supply Chain Management*, 11(1), 81-106. <https://doi.org/10.1108/JHLSCM-06-2020-0048>
- Gralla, E., & Goentzel, J. (2018). Humanitarian transportation planning: Evaluation of practice-based heuristics and recommendations for improvement. *European Journal of Operational Research*, 269(2), 436-450. <https://doi.org/10.1016/j.ejor.2018.02.012>
- Heaslip, G., Sharif, A. M., & Althonayan, A. (2012). Employing a systems-based perspective to the identification of inter-relationships within humanitarian logistics. *International Journal of Production Economics*, 139(2), 377-392. <https://doi.org/10.1016/j.ijpe.2012.05.022>
- Herdman, E. A. (2006). Derleme makale yazımında, konferans ve bildiri sunumu hazırlamada pratik bilgiler. *Hemşirelikte Eğitim ve Araştırma Dergisi*, 3(1), 2-4.

- Holguín-Veras, J., Jaller, M., Van Wassenhove, L. N., Pérez, N., & Wachtendorf, T. (2012). On the unique features of post-disaster humanitarian logistics. *Journal of Operations Management*, 30(7-8), 494-506. <https://doi.org/10.1016/j.jom.2012.08.003>
- Holguín-Veras, J., Jaller, M., & Wachtendorf, T. (2012). Comparative performance of alternative humanitarian logistic structures after the Port-au-Prince earthquake: ACEs, PIEs, and CANs. *Transportation Research Part A: Policy and Practice*, 46(10), 1623-1640. <https://doi.org/10.1016/j.tra.2012.08.002>
- Hotho, J., & Girschik, V. (2019). Corporate engagement in humanitarian action: Concepts, challenges, and areas for international business research. *Critical Perspectives on International Business*, 15(2/3), 201-218. <https://doi.org/10.1108/cpoib-02-2019-0015>
- Jahre, M., Jensen, L., & Listou, T. (2009). Theory development in humanitarian logistics: A framework and three cases. *Management Research News*, 32(11), 1008-1023. <https://doi.org/10.1108/01409170910998255>
- Kabra, G., & Ramesh, A. (2015). Segmenting Critical Factors for Enhancing the use of IT in Humanitarian Supply Chain Management. *Procedia - Social and Behavioral Sciences*, 189, 144-152. <https://doi.org/10.1016/j.sbspro.2015.03.208>
- Kabra, G., Ramesh, A., & Arshinder, K. (2015). Identification and prioritization of coordination barriers in humanitarian supply chain management. *International Journal of Disaster Risk Reduction*, 13, 128-138. <https://doi.org/10.1016/j.ijdrr.2015.01.011>
- Kent, G. (2014). Rights and obligations in international humanitarian assistance. *Disaster Prevention and Management*, 23(3), 214-221. <https://doi.org/10.1108/DPM-07-2013-0122>
- Kovács, G., & Spens, K. (2009). Identifying challenges in humanitarian logistics. *International Journal of Physical Distribution & Logistics Management*, 39(6), 506-528. <https://doi.org/10.1108/09600030910985848>
- Kovács, G., & Spens, K. M. (2007). Humanitarian logistics in disaster relief operations. *International Journal of Physical Distribution & Logistics Management*, 37(2), 99-114. <https://doi.org/10.1108/09600030710734820>
- Kovács, G., & Spens, K. M. (2011). Trends and developments in humanitarian logistics – a gap analysis. *International Journal of Physical Distribution & Logistics Management*, 41(1), 32-45. <https://doi.org/10.1108/09600031111101411>
- Lewin, R., Besiou, M., Lamarche, J.-B., Cahill, S., & Guerrero-Garcia, S. (2018). Delivering in a moving world...looking to our supply chains to meet the increasing scale, cost and complexity of humanitarian needs. *Journal of Humanitarian Logistics and Supply Chain Management*, 8(4), 518-532. <https://doi.org/10.1108/JHLSCM-10-2017-0048>

- Negero, Y. (2018). Factors affecting humanitarian supply chain efficiency: The case of International Rescue Committee (IRC) – Ethiopia Program. Addis Ababa Üniversitesi.
- Pateman, H., Hughes, K., & Cahoon, S. (2013). Humanizing Humanitarian Supply Chains: A Synthesis of Key Challenges. *The Asian Journal of Shipping and Logistics*, 29(1), 81-102. <https://doi.org/10.1016/j.ajsl.2013.05.005>
- Salam, M. A., & Khan, S. A. (2020). Lessons from the humanitarian disaster logistics management: A case study of the earthquake in Haiti. *Benchmarking: An International Journal*, 27(4), 1455-1473. <https://doi.org/10.1108/BIJ-04-2019-0165>
- Tatham, P. H., & Pettit, S. J. (2010). *Transforming humanitarian logistics: The journey to supply network management*. *International Journal of Physical Distribution & Logistics Management*, 40(8/9), 609-622. <https://doi.org/10.1108/09600031011079283>
- Tatham, P., & Spens, K. (2011). Towards a humanitarian logistics knowledge management system. *Disaster Prevention and Management: An International Journal*, 20(1), 6-26. <https://doi.org/10.1108/09653561111111054>
- Vaillancourt, A. (2016). Kit management in humanitarian supply chains. *International Journal of Disaster Risk Reduction*, 18, 64-71. <https://doi.org/10.1016/j.ijdrr.2016.06.002>
- Van Wassenhove, L. N. (2006). Humanitarian aid logistics: Supply chain management in high gear. *Journal of the Operational Research Society*, 57(5), 475-489. <https://doi.org/10.1057/palgrave.jors.2602125>
- Wankmüller, C., & Reiner, G. (2021). Identifying Challenges and Improvement Approaches for More Efficient Procurement Coordination in Relief Supply Chains. *Sustainability*, 13(4), 2204. <https://doi.org/10.3390/su13042204>
- Yuste, Campbell, Canyon, Childers, & Ryan. (2019). Synchronized Humanitarian, Military and Commercial Logistics: An Evolving Synergistic Partnership. *Safety*, 5(4), 67. <https://doi.org/10.3390/safety5040067>