

Logistics in Humanitarian Supply Chains

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Abstract

Logistics in humanitarian supply chains plays a key role in effective responding to humanitarian crises such as natural disasters, armed conflicts or epidemics. It is a process that involves planning, organising, managing and executing the activities necessary for a fast delivery of essential goods and services to those in need. The main objective is to minimise the response time and maximise efficiency in the delivery of aid, which includes ensuring the availability of resources such as food, water, medicine and shelter. Effective humanitarian logistics requires excellent planning and coordination between multiple agencies, stock management and the selection of appropriate modes of transport. It is also important to use technology, such as geographic information systems (GIS) and drones, to improve the efficiency and speed of response. Humanitarian logistics must also consider the proper balance of the immediate needs of victims with the long-term development goals of the affected regions. This requires flexibility and the ability to adapt to changing conditions, to manage risk, and to continuously assess and respond to current and future needs. Collaboration between humanitarian organisations, governments, the private sector and local communities is key to the effectiveness of these efforts.

Keywords: logistics, supply chain, aid, humanitarian aid

INTRODUCTION

Natural disasters and emergencies are occurring with increasing frequency and severity. Humanitarian aid plays a key role in the global response to crises and disasters, providing invaluable assistance to people affected by conflicts, natural disasters, epidemics and other emergencies. It aims not only to save lives and alleviate suffering, but also to protect human dignity in the most difficult moments.

International humanitarian law, also known as the law of armed conflict, is part of international law. It protects non-participants and those who cease to participate

in armed conflicts. It also limits the methods and means by which these conflicts are conducted.

The legal basis for humanitarian aid is based on international conventions, treaties and standards that govern the actions of states and international organisations in providing emergency assistance. One can distinguish the following legal frameworks for humanitarian action:

1. international conventions;
2. customary international law;
3. declarations;
4. bilateral agreements between states;
5. agreements between the ruling party and the opposition party (in the event of an internal armed conflict) (Kulczycki, Szandrocho, 2021).

The basic principles of international humanitarian law are:

- **the principle of humanity** - non-combatants and those who have ceased fighting should be guaranteed protection of life and health and respect for their personal rights – regardless of on which side they are;
- **the principle of distinction** - parties to an armed conflict should always distinguish between armed forces and civilians, who are subject to protection and cannot be attacked, and should always distinguish between goods of a civilian nature and military targets, against which only military operations can be directed;
- **the principle of military necessity** - parties to a conflict are obliged to comply with international law only to the extent that it does not conflict with military necessity. They may deviate from observance of that law solely and exclusively if doing so would protect them from considerable danger;
- **the principle of the avoidance of unnecessary suffering** - such military operations should not be conducted and such weapons should not be used that would unnecessarily increase the suffering or cause the death of people who are already incapable of fighting. In other words, warfare should be conducted only to the extent necessary to achieve victory; it is prohibited to use methods and means that would cause unjustified loss or excessive suffering;
- **the principle of proportionality** - a balance must be struck between the need to meet military requirements and the requirements of humanitarian law.¹

¹ <https://zpe.gov.pl/a/miedzynarodowe-prawo-humanitarne/D12rfNGbW> [accessed 20.04.2024];

Many humanitarian actors point out that logistics and management are the most important elements of successful humanitarian action. With this in mind, efforts have been made to develop the most effective tools for delivering aid. Humanitarian supply chains are one of such tools.

1. DEFINING HUMANITARIAN SUPPLY CHAINS

Numerous definitions can be found in the literature describing supply chains, where the supply chains are represented as a network of organisations, a process or a structure (Waściński, 2014). This is related to the process of globalisation, which leads to an increasing integrity and interdependence of economies, where individual companies have started to cooperate with each other and combine their shipments into a common supply chain (Michna and Kmiecik, 2012).

In process-related terms, a supply chain is “a sequence of events in the movement of goods that increases their value” (Marciniak, 2023, p. 66). When analysing the supply chain as a network of organisations, one can define it as “a group of organisations with their resources, vertically coordinated, between which material and information flows with the aim of delivering a product to the consumer under specified conditions” (Marciniak, 2023, p. 66). The supply chain as a structure is “a physical network that starts with the supplier and ends with the end customer. It encompasses aspects of product development, purchasing, production, physical distribution and after-sales services, as well as deliveries by third parties” (Marciniak, 2023, p. 66). To illustrate the variety and diversity of definitions of humanitarian supply chains, also referred to as ‘supply chains for life’, Table 1 summarises 6 different definitions of this concept.

Definition	Author and year
The humanitarian supply chain encompasses assessment, procurement, storage and transport, and rapid movement of people and materials, with the primary aim of helping as many people as possible.	Ghorbani and Ramezani, 2020
The function of the humanitarian supply chain is to deliver humanitarian assistance in a coherent and effective manner through the systematic application of tools such as strategic planning, data collection and information management, mobilisation of resources and accountability, and coordination of functional division of labour in the field, political negotiation and leadership.	John, Ramesh and Sridharan (2012)

The process of planning, implementing and controlling the flow of goods and services in an efficient and cost-effective manner, storage and also the efficient flow of information from the point of origin to the point of consumption according to the needs of those affected.	Thomas and Kopczak (2005)
A range of activities to establish control over a disaster or emergency, assist those affected and implement effective crisis management before, during and after an emergency.	Shulz (2008)
The organisation of the transport of first aid, food, water, sanitation and, most importantly, rescue and intervention units from the point of delivery to the disaster site, as well as an efficient and rapid evacuation of the injured to health centres or other designated safe locations.	Kovács and Spens (2007)
An effective humanitarian supply chain must be able to respond to multiple interventions as quickly as possible, despite the high level of uncertainty that is always present.	Van Wassenhove (2006)

Source: D. Marciniak, *Analiza komparatywna komercyjnego i humanitarnego łańcucha dostaw*, 2023.

An analysis of the above definitions clearly indicates that the authors primarily emphasise the specific and difficult conditions in which these chains have to operate. Another aspect highlighted is the purpose of the supply chains, which is to save human life and health. The NGOs involved in humanitarian aid stress that logistics and humanitarian supply chain management are the foundation of any successful humanitarian operation (Łupicka, 2011).

Through humanitarian supply chains, the most critical and urgent needs of affected people are met, and these include:

- medical care;
- evacuation services;
- transport services;
- supply of food and water (Łupicka, 2011).

In the 'supply chain for life', fundamental activities are referred to as the '5 B's', This is a term that describes five key areas of intervention or action to provide effective help and support to people in need. While different organisations may define these categories in different ways, it is generally accepted that they may include:

- *boxes* - the physical product delivered to the customer;
- *bytes* - information related to the order and its physical flow;
- *bucks* - financing, credit terms, repayment schedule, batch preparation for shipment;
- *bodies* - the human resources involved in the supply chain;

- *brains - knowledge and skills*” (Marciniak, 2023, p. 68).

The above components play an extremely important role in humanitarian supply chain management. Inconsistency in the performance of any one of them leads to a disruption in the others (Łupicka, 2011).

2. THE HUMANITARIAN SUPPLY CHAIN MANAGEMENT PROCEDURE

Humanitarian organisations operate under very specific conditions, thus the supply chain management in this sector is atypical. The logistics operations carried out are characterised by the need to react quickly and require constant monitoring of all the links at the same time. However, the most important thing is always the effectiveness of the aid.

For this reason, every humanitarian chain should comply with the principles of the ‘3A’ formula, which means:

- *agility* - meaning the ability to respond to unpredictably high demand within a very short lead time. By acting efficiently, we save time in the first place, which translates into more lives saved;
- *adaptability* - refers to the ability to adapt to rapid changes in the environment in which a humanitarian crisis has occurred;
- *alignment* - means having structured operating procedures that are common for all actors in the supply chain and a precise division of roles to indicate the role and tasks of each actor (Marciniak, 2023).

Humanitarian supply chains are made up of a very large number of independent actors operating in a complex and dynamic environment. Interdependencies, linkages and flows emerge between actors. Their variability and uniqueness make them very difficult to capture in any framework. The actors are interdependent, thus each of them is responsible for the delivery, from the moment the goods are procured until they reach their destination (Łupicka, 2011). The disaster response centre is the coordinator of the humanitarian supply chain, since the effectiveness, efficiency and speed of the chain guarantee adequate assistance to victims and affected people (Thomas and Kopczak, 2005). The ever-increasing number of natural disasters exerts enormous pressure on humanitarian organisations to deliver aid in an appropriate and cost-effective manner.

As described above, all the logistics processes that take place within the supply chain in support of humanitarian operations must be closely interlinked. If one element is not functioning properly, the whole humanitarian response process will be disrupted and aid may not be delivered. Humanitarian logistics, as one of the risk management processes in supply chains, is at the heart of all operations that require rapid response. Humanitarian supply chains consider the occurrence of the following processes:

- supply - its main purpose is to confirm that each organisation involved in the relief effort has adequate resources to meet real needs;
- transport - the aim is to get the goods needed to the site of the disaster. The transport strategy means the realistic possibility of getting resources from point A to point B safely and quickly;
- storage - its purpose is to secure the supplies until they reach the beneficiaries. It should be noted that the level of storage must take into account unforeseen, emergency needs;
- distribution - the most important objective in the supply chain is to deliver aid to those in need. The alternative is to outsource the delivery to organisations that specialise in the distribution of goods in order to minimise damage as quickly as possible (Łupicka, 2012).

When providing humanitarian aid, there is no question of organising transport or other logistical activities on a haphazard basis when a disaster strikes. All logistical activities should be planned in advance, starting with the relevant preparations and ending with the actions taken by a specific actor in the supply chain (Łupicka, 2012).

3. COMPARISON OF HUMANITARIAN AND COMMERCIAL CHAINS

Commercial and humanitarian supply chains share many common features, such as the need to manage resources, transport, storage and distribution of products. However, many authors in the field of humanitarian logistics point to many discrepancies in the functioning of humanitarian and commercial supply chains. One of the fundamental premises that distinguishes these chains is the so-called basic principle. This refers to the economy of operation, the reference to profit and the minimisation of costs in commercial chains. In humanitarian chains, the emphasis is on the efficiency and reliability of logistics operations in the delivery of aid (Pokusa, 2022).

There are also differences in the entities carrying out the activity. Commercial supply chains are shaped by the relationships within the structure: supplier, manufacturer, distribution centre, wholesaler, customer. Humanitarian supply chains, in turn, are coordinated by the public sector, mainly at local government level. They frequently work in close cooperation with intervention and rescue units, national and international organisations specialising in relief. In emergencies, the humanitarian chain is also supported by the military.

In addition, humanitarian supply chains are very often set up and operate without much of the necessary information, and decisions are made very quickly, even in the absence of complete data on the occurrence of an event on the ground. All communication and distribution processes are often hampered, and demand is highly unpredictable and entirely dependent on the occurrence of a disaster. In contrast, commercial supply chains operate in stable, predictable and often regulated environments. They are highly focused on long-term relationships with suppliers and customers.

Business supply chains use sophisticated, complex logistics networks designed for efficiency and scale. They use technological innovation to increase efficiency and reduce costs. Humanitarian supply chains, in contrast, use simple, flexible and rapidly adaptable logistics networks. It is also worth noting the way in which relationships are established in both chains. Business chains are based on contracts and negotiations. Humanitarian supply chains are based on trust, cooperation and humanitarian needs (Marciniak, 2023).

Aside from the above differences, it is important to note also the similarities between these two types of supply chains. Inventory management is a key element in both commercial and humanitarian supply chains. In both cases, inventory needs to be carefully planned, monitored and controlled to ensure optimal levels of product availability, while minimising surpluses and avoiding shortages.

Both types of supply chain depend on an effective logistics and distribution system that includes transport, storage and management of the flow of goods. In both cases, it is essential that goods are delivered at the right time, to the right place and in the right condition. Both commercial and humanitarian supply chains use modern technology to track and manage the flow of goods. Systems such as customer relationship management (CRM), enterprise resource planning (ERP) and

geographic information systems (GIS) are used to make operations more efficient and transparent.

In both types of supply chain, collaboration between different actors such as suppliers, distributors and customers (or beneficiaries in the humanitarian case) is essential to achieve objectives. Effective partnerships and coordination of activities are key to managing complex operations and achieving effective results. In both commercial and humanitarian supply chains, there is a constant drive to improve processes to increase efficiency, reduce costs and be more responsive to needs. In both cases, organisations seek to innovate and adapt to changing conditions to improve their operational effectiveness. Both types of supply chains face similar challenges and risks, such as transportation obstacles, demand volatility, government regulations, natural disaster risks and other unforeseen events that can disrupt normal operations.

Humanitarian logistics, in its social dimension, should focus on the proper management of existing resources, which are still necessary for daily life under certain conditions, as well as technical, informational and financial resources. This has to do with the provision of certain conditions that should be in place in order for humanitarian action to have the intended effect (Pokusa, 2022).

To summarise, commercial supply chains focus on efficiency, stability and profitability, while humanitarian supply chains focus on speed, flexibility and the effective management of sudden and dynamically changing needs in challenging environments. Each type of supply chain has its own specific challenges and management methods that are best suited to its objectives and operating environment.

It is also worth mentioning the ways to assess the effectiveness of the humanitarian supply chain. It is crucial to ensure that aid reaches those in need at the right time and in the right amount. This requires specific indicators and evaluation methods that take into account the unique challenges and objectives of humanitarian operations. We can assess the performance of humanitarian supply chains through factors such as:

1. Response time - consists in measuring how quickly a humanitarian organisation is able to respond to a crisis from the moment it occurs until the aid is delivered. Short response times are crucial, especially in emergencies such as natural disasters, where every minute can make a difference in saving lives and health. The method of assessment is to monitor the time from notification of a crisis to the start of relief operations, to analyse the average time of aid delivery

in different humanitarian operations, and to compare response times with the established organisational standards and targets.

2. Resource availability - refers to an organisation's ability to maintain adequate levels of supplies needed to respond quickly to a crisis. This includes resources such as food, water, medicines, tents and other relief items. The method for assessing this is through regular stock audits of warehouses and distribution centres, assessing the time it takes to replenish stocks once they have been used, and monitoring stock levels in real time through warehouse management systems.
3. Distribution efficiency – consists in measuring how effectively aid reaches the areas where it is most necessary. It includes the assessment of transport routes, the use of means of transport and the efficiency of logistics operations. In this case, the method of evaluation is to analyse the ratio of the aid delivered to the aid planned; to monitor the number of delays and their causes; and to assess the use of different modes of transport and their efficiency.
4. Delivery costs – consist in measuring the expenditures associated with the logistics and distribution of aid. This includes transport, storage, personnel and other operational costs. The method of evaluation relies on analysing the cost per unit of aid delivered (e.g., cost per tonne of food), comparing delivery costs with the operational budget, and identifying areas where costs can be reduced without compromising the quality and speed of delivery.
5. Outreach and scale of assistance - refer to the number of people assisted and the range of services provided. It is important that humanitarian organisations are able to effectively reach as many people in need as possible. Monitoring the number of beneficiaries in different regions, quantifying the range of services provided (e.g., quantities of food delivered, number of tents erected) and analysing the geographical coverage of operations are methods to assess this parameter.
6. Coordination and cooperation – consist in measuring the effectiveness of cooperation between different humanitarian agencies, governments, local partners and other stakeholders. Good coordination increases the effectiveness of activities and avoids duplication. The evaluation method is to assess the quality of communication between partners, analyse the number and effectiveness of established partnerships, and monitor the effectiveness of joint activities and projects.
7. Satisfaction – consists in measuring the level of satisfaction of those who have received assistance. It is an important indicator of effectiveness, because it shows whether the assistance provided meets the needs and expectations of those in need. We can assess this parameter by conducting surveys and interviews

with beneficiaries, analysing feedback and testimonies collected directly from people who have received aid, and monitoring the number of complaints and problems reported.

Evaluating the effectiveness of the humanitarian supply chain is a multifaceted process that involves measuring response times, resource availability, distribution efficiency, delivery costs, aid reach and scale, coordination of activities, and beneficiary satisfaction. By using these indicators and methods, humanitarian organisations can identify areas for improvement, make better strategic and operational decisions, and fulfil their mission to help those in need more effectively.

CONCLUSION

Present times are characterised by high volatility and dynamism, while the continuous technological and social progress is inextricably linked to an increased risk of natural or industrial disasters. Such events most often lead to epidemics, floods, earthquakes, poverty or crime, to name a few (Sienkiewicz - Maryjrek, 2011). The occurrence of emergencies requires a different approach to the role of logistics and supply chains. This is because each disaster is characterised by different features that are unpredictable factors, such as high time pressure, low availability of critical information or complex logistics processes (Marzantowicz, 2015).

Logistics in humanitarian supply chains is a key element in the effective response to humanitarian crises around the world. Its importance cannot be overstated, since a well-managed supply chain can significantly speed up the delivery of aid, minimise suffering and enable affected communities to recover faster. The challenges in this area are enormous, encompassing both the logistical aspects of aid delivery and the complex operational environment in which humanitarian organisations must operate. Constant adaptation to changing conditions and technological developments that can significantly improve the efficiency of operations are essential.

The importance of international and inter-agency cooperation in overcoming political, cultural and infrastructural obstacles should not be overlooked. Only through integrated and well-coordinated action can the maximum effectiveness of humanitarian operations be achieved. Humanitarian aid is not only a moral obligation, but also a legal and strategic obligation under international conventions and human rights law. For this reason, further investment in the development of

humanitarian logistics is essential to ensure that aid reaches all those who need it, quickly and regardless of the difficulties.

In conclusion, humanitarian supply chain actors need to be aware of the potential risks and logistical needs of local populations. The volatile and difficult conditions in emergencies lead to the conclusion that logistics is a key component of humanitarian aid, because it is the link that connects all elements of aid.

BIBLIOGRAPHY

- [1] Ł. Marzantowicz. 'Prewencyjna rola logistyki w katastrofie'. *Acta Universitatis Nicolai Copenici*. *Ekonomia* XLVI no. 2, 2015, pp. 173-184.
- [2] A. Łupicka. *Logistyka akcji humanitarnych jako jeden z procesów zarządzania ryzykiem w łańcuchach dostaw* [in:] *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, No. 234, 2011.
- [3] A. Łupicka. 'Wsparcie logistyczne akcji humanitarnych'. *Logistyka*, no. 2, pp. 40-42, 2012.
- [4] A. Michna, M. Kmiecik. 'Orientacja rynkowa a zarządzanie wiedzą w kontekście rozwoju i wzrostu małych i średnich przedsiębiorstw'. *Zeszyty Naukowe Politechniki Śląskiej*, Is. 60, col. no. 1871, pp. 203-216, 2012.
- [5] K. Sienkiewicz-Małyjurek. 'Logistyka humanitarna – odpowiedź na współczesne zagrożenia'. *Ekonomia i Organizacja Przedsiębiorstwa*, no. 2(733), pp. 34-44, 2011.
- [6] T. Wściński. 'Procesy logistyczne w zarządzaniu łańcuchem dostaw'. *Zeszyty naukowe Uniwersytetu Przyrodniczo-humanistycznego w Siedlcach*, series: *Administracja i Zarządzanie*, no. 103, pp. 25-38, 2014.
- [7] T. Pokusa. 'Logistyka humanitarna jako społeczne wyzwanie współczesnych czasów'. *Gospodarka Materialowa i Logistyka*, pp. 14-21.
- [8] M. Kulczycki, R. Szandrocho. *Wybrane aspekty prawne pomocy humanitarnej i funkcjonowania NGO w konfliktach zbrojnych*. Wrocław, pp. 13-21, 2021.
- [9] <https://zpe.gov.pl/a/miedzynarodowe-prawo-humanitarne/D12rfNGbW> [accessed 20.04.2024].

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