

The relationship between Humanitarian Logistics and Reverse Logistics: characteristics, actions, and singularities between both

La relación entre la Logística Humanitaria y la Logística Inversa: características, acciones y singularidades entre ambas

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ABSTRACT

Situations that demand emergency actions, such as natural disasters (hurricanes, earthquakes, tsunamis, floods), require special logistics posture, which is being called humanitarian logistics. This is still a new concept in Brazil, but it has been studied more and more in European countries and the United States. Humanitarian logistics is the branch of logistics responsible for processes that involve the mobilization of resources, knowledge, and people to support communities affected by emergencies, such as natural disasters, wars, or terrorist attacks. Reverse logistics is another branch of logistics that is concerned with the return of the goods and products flowing from the primary client and which may be sent to dumpsites, recycling, or reuse. However, when these materials are managed differently, they may reach people who were affected by natural disasters or not, characterizing the humanitarian logistics. This article seeks to define, compare and relate the single elements of traditional logistics (direct flow), humanitarian and reverse logistics. It also seeks to show the way to an effective integration between these three logistics branches in order to take advantage of the best to help victims of any disaster.

Keywords: humanitarian logistics, natural disasters, recycling, reverse logistics.

RESUMEN

Las situaciones que exigen acciones de emergencia, como las catástrofes naturales (huracanes, terremotos, tsunamis, inundaciones), requieren una postura logística especial, que se está llamando logística humanitaria. Este concepto es todavía nuevo en Brasil, pero se ha estudiado cada vez más en los países europeos y en los Estados Unidos. La logística humanitaria es la rama de la logística responsable de los procesos que implican la movilización de recursos, conocimientos y personas para apoyar a las comunidades afectadas por emergencias, como catástrofes naturales, guerras o ataques terroristas. La logística inversa es otra rama de la logística que se ocupa del retorno de los bienes y productos procedentes del cliente primario y que pueden ser enviados a vertederos, reciclados o reutilizados. Sin embargo, cuando estos materiales se gestionan de forma diferente, pueden llegar a las personas afectadas por las

catástrofes naturales o no, lo que caracteriza a la logística humanitaria. Este artículo pretende definir, comparar y relacionar los elementos individuales de la logística tradicional (flujo directo), la logística humanitaria y la logística inversa. También pretende mostrar el camino hacia una integración efectiva entre estas tres ramas de la logística con el fin de aprovechar lo mejor para ayudar a las víctimas de cualquier catástrofe.

Palabras clave: logística humanitaria, catástrofes naturales, reciclaje, logística inversa.

1 INTRODUCTION

The area of traditional logistics, as it is known today, focuses on industry, commerce, and the service sector. In a certain manner, these economic agents seek to implement logistics concepts, as these concepts constitute a competitive differential concerning their competitors. The right product, at the right place and time for use or consumption, with adequate quality and price, can be decisive for a customer's buying attitude.

In humanitarian logistics, the various climatic accidents that have occurred in Brazil, such as the flood in the city of São Luiz do Paraitinga/SP in early 2010, the "fall" of Morro do Bumba in Niterói/RJ in April 2010 caused by heavy rains, and the flood in Blumenau/SC in September 2013, highlights a situation that requires immediate and fast relief. Literatures (few national ones mainly) in this new area state that, in situations of this nature, the use of traditional logistics concepts can contribute significantly to the success of a relief operation. Thus, one can see that the challenges point to the need to adopt systematized logistics processes, highlighting aspects associated with infrastructure, location of assistance centers, and coordination of processes involving people, supplies, information, and support materials.

According to Leite (2011) and according to the National Solid Waste Policy (PNRS) reverse logistics is known for a set of actions and procedures so as to enable the collection and return of post-sale and post-consumption solid waste to the supply chain or other destination. Leite (2011) further understands that products have a useful life cycle of a few days, weeks, or years and after this period, they are discarded by society in various ways, constituting post-consumption goods and solid waste in general. Post-consumption is considered and constituted by every product that leaves the hands of the consumer (final customer) and returns in some way for recycling or use by others, either by donation or secondary trade (clothing stores, household items, vehicles, etc.).

This article seeks to define, compare and contrast humanitarian logistics with post-consumption reverse logistics, identifying the challenges that may be faced by humanitarian logistics and the position to be adopted when the need arises, seeking to point the way to an understanding between the academic world, relief organizations and the behavior of the population not affected by any phenomenon, but that has the desire to help victims (volunteers).

The article initially addresses the concepts associated with logistics focused on the normal process of an organization, followed by the concepts of humanitarian logistics, and finally the concepts of reverse logistics. Next, a contrast and comparison are made between humanitarian logistics and reverse logistics, presenting the main challenges associated with humanitarian logistics and the understanding of volunteers regarding the disposal of goods and products considered out of use by the family.

2 LOGISTICS - THE DIRECT FLOW PROCESS

The geography of logistics is an area of business operations that involves a complexity not seen in any other area.

For Bowersox, Closs, and Cooper (2006) logistics is concerned with taking products and services to where they are needed, twenty-four hours a day and seven days a week. One cannot notice any Marketing, Production, or International Trade action without logistics. It is known that logistics has existed since the time of Moses, for in order to take his people to the promised land, he used logistics to feed, give them something to drink, and move around in the desert. Therefore, it is an ancient activity that has been improved over time.

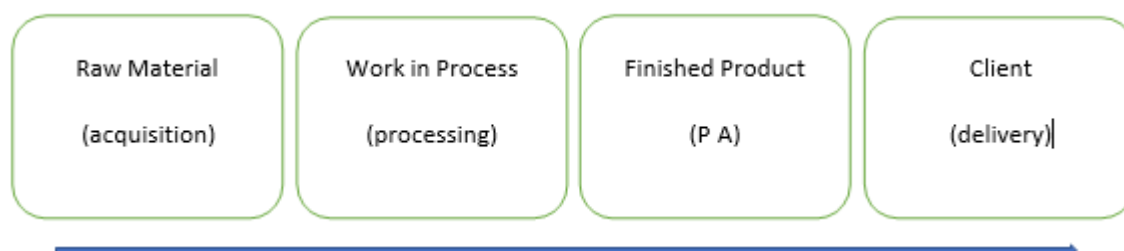
Logistics processing management involves the inventory and transportation of orders and the combination of warehousing, material handling, and packaging, integrated through a network of facilities.

According to Bowersox, Closs, and Cooper (2006), the objective of logistics is to support the areas of purchases, production, and distribution operations to the market. Logistics promotes operational synchronization about clients, as well as suppliers of materials and services, integrating internal and external operations to the organization.

According to Ballou (2001, p.21) "logistics is the process of planning, implementing, and controlling the efficient and cost-effective flow of raw materials, work in process, finished goods, and related information from the point of origin to the point of consumption to meet customer requirements."

Therefore, it is possible to comment that logistics is the management of the product flow from the point of acquisition to the customers. Figure 1 schematically illustrates the logistics process in a typical organization.

Figure 1: Direction of logistics flow from raw material to customer.



Source: Authors (2021)

The logistics process shown in the figure consists, in general, in the acquisition of raw materials for transformation, then for processing, i.e., obtaining components, forming in some cases, stocks of parts due to bottlenecks in the industrial park and, after this processing, the assembly of the various components, to obtain the finished product. The last stage is the shipping and delivery of the final product to the customer.

Logistics must then add value in the eyes of the customer when inventory is strategically positioned to meet sales.

Adding logistics value involves some elements, according to Bowersox, Closs, and Cooper (2006) that the customer perceives and pays for. These elements are described below:

2.1 BENEFIT OF LOGISTICS SERVICE

When the company is willing to take the maxim of logistics seriously, delivering the right material, at the right time, and at the moment the customer wants, the benefit in the eyes of the consumer is for the company to maintain a stock of products geographically close to the market for immediate delivery, or to prepare a fleet of vehicles in a state of readiness to meet an urgent request from a customer.

2.2 AVAILABILITY OF PRODUCTS AND SERVICES

Having availability means consistently meeting customer requirements. However, not necessarily the company needs to leave the inventory high because customers usually maintain a certain level of safety stock. Thus, the supplier must make use of information technology to achieve ready availability of inventory and provide immediate transportation, (CORRÊA, 2010).

2.3 OPERATIONAL PERFORMANCE

In this type of benefit, the company must deal with two conjunctures: speed and consistency. Customers want fast delivery, but there is limited value here, because between one order and another, if there is no consistency of delivery, the customer will derive little benefit. Therefore, to operate relatively smoothly, organizations must focus on service consistency and then improve delivery speed, (CORRÊA, 2010).

2.4 SERVICE RELIABILITY

This item practically "ties" the previous ones since it involves logistics quality - a key process in an accurate evaluation of availability and operational performance. Bowersox, Closs and Cooper (2006,

p.47) comment that "the basic logistics service level must be realistic in terms of customer expectations and needs".

The direct flow in logistics, involving from raw material to the obtaining of the final product is the process that interconnects several agents in an organization, because it is functional in its nature aiming to achieve a logic in the operations.

3 HUMANITARIAN LOGISTICS - BASIC CONCEPTS

According to Beamon (2004), humanitarian logistics is the operation that aims to order the flow of people, materials, and information in an appropriate and timely manner in the chain of assistance and relief, with the intention of correctly assisting the greatest number of people.

For Thomas and Kopczak (2007), humanitarian logistics "is the process of planning, implementing, and controlling the efficient and effective flow of goods from point of origin to point of consumption in order to alleviate the suffering of vulnerable people."

Humanitarian logistics involves, in addition to planning, procurement, transportation, storage, tracking, and monitoring, the well-defined flow of information and communication in response to disasters (Kovacs and Spens, 2007).

According to the International Federation of the Red Cross (apud Nogueira et al., 2013), "Humanitarian logistics are processes and systems involved in mobilizing people, resources, and knowledge to help vulnerable communities affected by natural disasters or complex emergencies. It also seeks a prompt response, aiming to serve the largest number of people, avoid shortages and waste, organize the various donations that are received in these cases, and, above all, act within a limited budget. The prompt and rapid assistance to the relief process is among the most dynamic and complex phases, yet receives little attention from government organizations and research in the area. It is relatively common, after the occurrence of a disaster, to request the support of specialists in logistics, losing fundamental points in the overall process. Recognizing the importance of, investing in, and prioritizing all phases of logistics is critical for relief organizations. Meirim, 2006 (apud dos Santos et al., 2013) highlights important and challenging points to humanitarian logistics: Materials - what will it take? Where should it be sent? It is visible in the news, in several disasters, the volume of donations in the first weeks, which can generate waste, malfunctions, and even product deviations, besides the arrival of inadequate materials to meet the needs of that moment.

Lack of coordinated processes - whether in relation to the flow of information, people, and materials.

Infrastructure - is destroyed in most of the events, making it difficult for access, for two-way arrival of resources and information, and for people to leave.

Human resources - too many people (volunteers) willing to help, but without adequate training, people acting only on emotion, and people going to the site without having an idea of the magnitude and complexity of the problem.

One notices that, in general, humanitarian logistics proposes the effective use of logistics concepts adapted to the needs of the chain of humanitarian assistance and aid. These concepts can be the differential when they indicate the maximization of efficiency and the fastest response time to the emergency situation.

4 REVERSE LOGISTICS

Until recently, the term 'reverse logistics' was little known to the general public and with few practical applications. There were few studies on the subject, since the most practiced and active concept was the normal logistical flow, also known as the direct flow of materials in organizations.

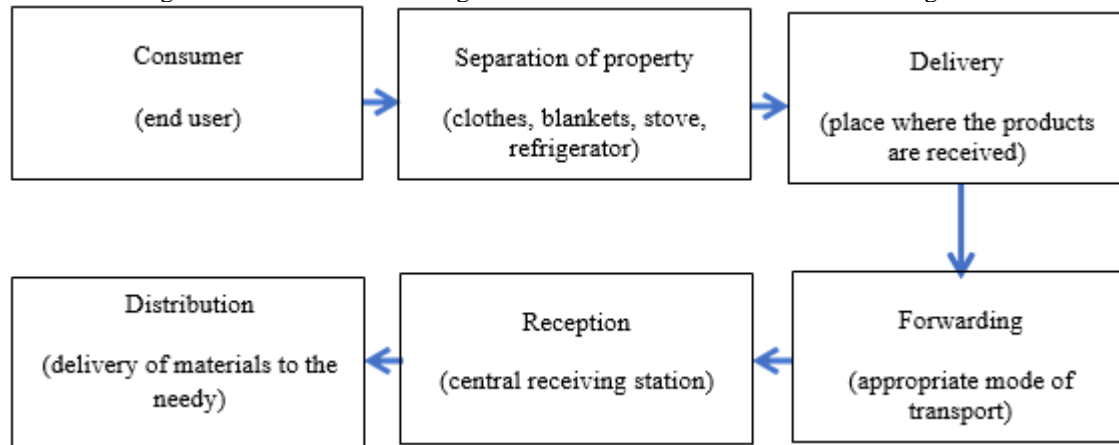
For Leite (2006), transaction flows at reverse channels are generally a fraction of those of the direct channels of produced goods. Still according to the author, reverse logistics concentrates on the flow that flows in the opposite direction to that of the direct chain, as of products discarded as post-sale or post- consumption.

Many of the reverse logistics flows in supply networks, according to Corrêa (2010) are established as part of the effort to create sustainable supply networks.

Xavier and Corrêa (2013, p.6) comment that sustainable development "is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." In this way, one aspect that can be taken into consideration nowadays concerns the term sustainability, in the sense of making the most of the useful life of equipment, clothes, and goods used in daily life by consumers.

Figure 2 schematically shows the reverse logistical flow of disposable goods that can be destined for humanitarian logistics.

Figure 2 - Schematic of the logistical flow of material for humanitarian logistics.



Source: Authors (2021)

The figure shows that the reverse flow is provided from the moment that some product purchased by the consumer is discarded by the same or donated (not yet consumed, in this case), and follows a path destined to someone who is in need of material for the various purposes.

However, products that are considered "old" by consumers can have their useful life cycle extended, when there is a natural disaster or not, in which there are victims in need of goods such as stoves, refrigerators, beds, etc., or in need of clothes, blankets, mattresses, etc., depending on the type of occurrence suffered.

5 FINAL CONSIDERATIONS

Disasters over the past few years have occurred with more intensity and with greater frequency, and, it is known that man's interference in the environment will cause new disasters probably with greater force (Thomas and Kopzack, 2007).

Knowing how to handle the contingent of needs in these events becomes crucial, because any incorrect decision can increase the tragedy and bring countless lives to term.

Chart 1 shows a comparison of actions in Logistics (direct flow), Humanitarian Logistics, and Reverse Logistics.

Table 1- Comparison of actions between Logistics, Humanitarian Logistics and Reverse Logistics.

Factors	Logistics - direct flow	Humanitarian Logistics	Reverse Logistics
Demand	Relatively stable, it takes place in a pre-defined market, and in adjusted quantities.	Generated by unexpected events, largely unpredictable in terms of time, place, and size. There may be some estimation after the event.	Unpredictable, the final command needs stimulation and discards many times to make room.
Lead time	According to the needs, it goes from the supplier to the end customer.	No - it occurs according to the situation encountered.	It occurs all the time, goes from the end customer to the production flow when disposed of properly.
Service Center	Well defined as to the required number of locations.	Indefinite until the characteristics of the disaster are known - location, size, and type.	There is not - it only occurs when you set up material collection areas.
Inventory Control	Use of adequate and appropriate methods such as <i>Kanban</i> , First In First Out (PEPS) system.	There is great variation in demand, which creates challenges for locating material storage.	There is no first collector (usually waste pickers), they sell the product when they see the possibility of making a profit.
Goals	Quality with lower cost, customer satisfaction.	Collection of supplies and goods.	Disposal of unserviceable material for individuals and companies.
Focus	Products and services to satisfy customers.	Assistance to people in need.	Assisting people with materials that are no longer used.

Source: Adapted from Nogueira et al. (2013)

One can clearly perceive that there are differences between logistics - direct flow, humanitarian logistics and reverse logistics. In the former, one notices that the demand can be predictable and there is a certain control in all stages of processing, considering the acquisition of raw materials, processing, obtaining of the finished product, and distribution. In humanitarian logistics, on the other hand, the demand is unpredictable, the locations are unknown, and it is only possible to estimate the needs after the occurrence and initial survey. In reverse logistics, the demand, in cases of natural or unnatural disasters and accidents, is stimulated by the occurrence of the event, and its objective is to collect various goods and basic supplies, depending on each situation. The basic focus of humanitarian logistics is to provide relief and medical assistance - initially and, later, the distribution of supplies such as water, blankets, clothes, etc., as the case may be.

The stimulus that occurs in society and the response of people with the most diverse donations is remarkable, but if there is no order, control, and protection, the risk of losing much of the goods collected through donations is high, which is why the logistics process of direct flow must and can be adapted to ease the suffering of victims of natural disasters or not.

6 CONCLUSION

Natural and other disasters have become more frequent in recent decades, and it is known that they may occur with greater intensity and frequency in the next 50 years. It becomes crucial, therefore, to deal with the contingent of diverse needs in these events, because an inaccurate or incorrect decision can lead to an increase in the problem and bring countless lives to an end.

Logistics is usually thought of as the management of the flow of materials from the point of acquisition of a given raw material, processing, or finished product to the point of consumption - the end customer. However, there is a reverse logistics flow that occurs when some product flows out of the hands of the final consumer, and may return to the point of origin or be reused by a second user. Therefore, the reverse flow of materials is not always directed to recycling or disposal.

Humanitarian logistics requires a series of actions that can often occur in a way that leaves gaps for its proper development, since it will only be possible to measure the magnitude of the fact after the occurrence. Therefore, it is important to know, under the aspect of humanitarian aid, the beneficiary itself. This is because we often deal with different cultures within the same country, state, or community, and there may be misinterpretations of decisions regarding behavioral norms and power relations in a given area to be served.

The association of humanitarian logistics with reverse logistics occurs precisely because there is a reaction from the population not affected by a disaster to help an affected community. It is possible to notice that many people end up discarding a series of goods, including clothes, stove, and refrigerator that are "leaning" in some corner of their homes because they see the possibility of vacating the place. It is important to consider that this disposal deserves praise, for the help and good intention of people in helping others who are suffering due to an occurrence.

In the disasters that have recently happened in Brazil, it was possible to observe the quantity of clothes, for example, that were donated and, in many cases, are still being "stored" in warehouses provided by the city halls, and are spoiling due to poor conservation and the lack of adequate distribution logistics. The present study analyzed and described the evolution of reverse logistics studies, as well as showed an association between the three logistics situations, especially the relationship between humanitarian logistics and reverse logistics, which occurs, undoubtedly with the best intentions by the population that reacts by donating goods that are no longer used, and that may well be used by a second user.

Thus, it is important to point out that in the event of a disaster, it is necessary to set up an adequate logistical flow, so that there is a rapid response of help and attention to the needy people involved. The conceptual approach aimed at launching elements for the development of a systemic study of humanitarian logistics associated with the reverse logistics of goods and products, mainly at the national level.

REFERENCES

- BALLOU, R. H. Supply chain management - planning, organization and business logistics. Porto Alegre, Bookman, 4^a ed., 2001.
- BEAMON, B.M. Humanitarian Relief Chains: issues and challenges. 34th International Conference on computers and industrial engineering. San Francisco, CA, USA, 2004.
- BOWERSOX, D. J., CLOSS, D. J., COOPER, M.B. Gestão logística de cadeias de suprimentos. Porto Alegre, Bookman, 2006.
- CORRÊA, H. L. Supply chain management - integrating supply chains in the globalized world. São Paulo. Atlas. 2010.
- DOS SANTOS, E. A., VILLAR, C. B., BURGARELLI, E. Humanitarian logistics: concepts, relationships and opportunities. Available at.
- KOVACKS, G., SPENS, K. Humanitarian logistics in disaster relief operations. International Journal of Physical Distribution & Logistics Management, v.37, n. 2, p. 99-114, 2007.
- LEITE, P. R. Logística reversa - meio ambiente e competitividade. São Paulo. Prentice Hall, 2006.
- _____, P.R. Logística reversa - nova área da logística empresarial. São Paulo. Revista Tecnológica, v. 3, n. 7, Jun/2011.
- MEIRIM, H. Logística humanitária & logística empresarial. Sapucaia do Sul, Available at <http://www.mmrbrasil.com.br/artigos/40.pdf>, accessed April/2015.
- NOGUEIRA, C. W., GONÇALVES, M.B., NOVAES, A. G. Logística humanitária e logística empresarial: relações, conceitos e desafios. Anais do XXI Congresso de Pesquisa e Ensino em Transportes, Rio de Janeiro, 2008.
- THOMAS, A., KOPCZAK, L.R. Life-saving supply chain excellence in emerging economies, Springer Science and Business Media LLC, London, UK, p. 93-111, 2007.
- XAVIER, L. H., CORRÊA, H.L. Reverse logistics systems - creating sustainable supply chains. São Paulo. Atlas. 2013.