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LOGISTIC SUPPORT FOR DISASTER - STRICKEN AREAS: THE CONCEPT AND PRACTITIONER'S CHALLENGES DURING NATURAL DISASTERS

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ABSTRACT

This research is important because humanitarian logistics, as a science is relatively new and as such, there is a distinct lack of available literature on the foundations of the science and related terminology. In addition, this new field is still under development. These were the reasons underlying the researcher's decision to undertake the study. As a management discipline, humanitarian logistics is a relatively new discipline. Just like any other discipline, this branch of logistics knowledge is based on a number of scientific principles. It has its own applications and characteristics, which make it different.

This article is a conceptual discussion that outlines the problems and challenges associated with Logistic Support for the Disaster - Stricken Areas. Results show that the main problem and the greatest challenge faces the relief operation in general, and the humanitarian logistics sector in particular, is in the system itself that is replacing one or about to collapse or which has already collapsed due to weak facilities and doubled resource needs in a complex hostile environment, like sending aid in wartime conditions wartime. Disasters have a distinguished nature, as each has different characteristics and conditions.

Keywords: Humanitarian logistics, natural disasters, disaster - stricken areas, disaster response.

Introduction

Facing disasters and getting prepared for them needs an organised, practical effort prior to the event which causes the disaster and emergency plans based on large databases including everything related to the disaster. In addition, there is a need for prior planning to study how to mobilise potential and energies, and deploy them quickly to the event site in time to ensure the prevention or exacerbation of the situation and to minimise the negative results. Thus, the impact can be contained, and things can be restored to normal.

Logistics management is the most suitable means in the operation of supplies and support of the stricken areas. The term 'logistics' finds its roots in the military terminology for the technology used for the purposes of transport, supply and the mobilisation of troops and armed forces. is considered the core of administrative thought in the various humanitarian, economic, and military activities. Logistics includes, in some respects, in the transformation of time into an added economic force and thus, an added productive value that, in turn, turns into flows of wealth that strengthens the set of competitive advantages, which benefit all parties, including producers, suppliers, and customers. The application of logistics management in the field of relief is similar to that of the military one. The principles of logistics science were used by the United States in World War II to solve the issues involved in providing for the troops fighting in Europe. Therefore, we are in a state of war, where the enemy here is the wrath of nature floods, earthquakes, and volcanoes. It is a humanitarian aid against the vagaries of nature and man-made conflict.

Definition of Disaster - Stricken Areas: An area where there has been a major disaster (such as a flood, tornado, or earthquake) and where people can receive special help from the government (such as money to rebuild homes or emergency supplies) https://www.britannica.com/dictionary/disaster-area

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Scientifically, logistics can be defined as an operation of planning, implementing and applying monitoring and controlling the effective flow and storage of goods, services and related information to deliver them at an appropriate time, place, accurately, and at a low cost. This should be done from the starting point until the consumption point to achieve the humanitarian requirements of the affected people.

The importance of logistics lies in the fact that it creates the feeling of solidarity, reduces the impact of disasters, and helps those affected survive by providing them with the basic needs for everyday life. The application of logistics helps reduce physical, temporary, and human losses. The importance of logistics lies in the fact that it creates the feeling of solidarity, reduces the impact of the disasters, and helps those affected survive by providing them with basic necessities for everyday life. The application of logistics helps reduce physical, temporary, and human losses.

Literature Review

The purpose of a literature review is to provide a foundation on the topic of humanitarian logistics, and the challenges faced by practitioners in the event of a natural disaster.

In this section, we review the relevant literature on humanitarian logistics, including work by Stephenson, R. S. (1995), who reviewed the literature on the role of logistics in the provision of aid to disaster survivors as well as its place in conducting other disaster management operations.

There is a study that emphasised the need to operate effectively supply chain management in humanitarian logistics. Thomas Anisya and Kopczak Laura (2005) discussed background on the current state of logistics in the humanitarian environment, and the factors that have limited the evolution of knowledge and the performance of supply chains for humanitarian relief.

While Samii Raminn (2008) discussed the role and contributions of humanitarian partnerships in the performance of humanitarian organisations during disaster response. As a first step, the study explores the ability of humanitarian organisations to manage their temporary supply networks in response to emergencies and identifies the capabilities of humanitarian organisations to coordinate their response with other agencies, as well as stakeholders. Shared as an effective disaster mitigation measure regarding deficiencies in logistics systems. The study believes that partnerships with the private sector and civil society organisations can enhance the ability of humanitarian aid societies to overcome existing weaknesses related to resource availability, allocation, and capability.

Similarly, Rodman William K. (2004) focused on how to create a framework that facilitates understanding of the solutions and logistics problems faced by humanitarian aid organisations during emergencies, the proposed solutions to address these issues have been based on methods used by humanitarian aid organisations, the military and the private sector to overcome similar problems.

On the other hand, Roh Saeyeon *et al*. (2015) reviewed the challenges in humanitarian relief operations relating to pre-positioned warehouses. For this purpose, this study explores the main risk factors of pre-positioned humanitarian distribution centres through interviews with practitioners in humanitarian aid organisations.

S. Adiguzel, S. (2019) discussed investigating logistics processes at every stage of disaster logistics. The research concluded that it is necessary to prepare disaster response plans for unforeseen events before and after the disaster occurs, logistics simulations are applied and drills are practiced. For urgent needs, materials such as tents, blankets, beds, heaters, and

kitchen sets with a long shelf life should be provided by signing protocols with suppliers. Several firms should be preferred instead of one. Personnel training is important in disaster logistics. The logistics unit personnel should be distributed according to their talents throughout the organisation. Plans must be initiative-taking, before, during, and after disaster plans should be reviewed.

Finally, Khan, M., M. Khan *et al*. (2022) discussed the importance of digitalisation for fast, fair, and safe humanitarian logistics. The findings revealed a substantial positive association between predictive variables (digitalisation) and response variables (accountability, security, trust, transparency, and promptness). This research revealed that digital solutions play a considerable role in enhancing fast, fair, and safe humanitarian logistics. It may be concluded that incorporating digital solutions into disaster relief efforts can save lives, alleviate human suffering, and promote development. Similarly, study's outcomes show that digitalisation improves fast, fair, and safe humanitarian logistics, thus, adding to the existing body of knowledge and paving the way for future development of disaster relief.

Methodology

Based on the nature of the purpose and to achieve it, an inductive approach was applied. This research does not involve conducting any practical experiments; it does not depend on numbers as in quantitative studies on qualitative data.

Results and Discussion

The Concept of Humanitarian Logistics and its Characteristics

Humanitarian logistics, or humanitarian relief logistics is a branch of logistics management science that depended, in its emerging and development, on a mixture of experiences and share of humanitarian, commercial and military sectors altogether. It is a general term for a mixture of operations and activities that care for relief in disaster time, in addition to the continual support to rehabilitate and reconstruct the affected regions.

Despite of the great deal of similarity between humanitarian logistics and commercial logistics concerning the theoretical bases, the former still has a special nature, being more complicated than the latter, 'the managers of the humanitarian logistics services have to work in complex environments with limited damaged infrastructure, unpaved roads, and poor communication. They also suffer from uncertainty, lack of informations and difficulty in making decisions. According to 'Jane Queen' from 'Doctors without Frontiers Organisation', the definition of logistics in the commercial field is 'the tip of the iceberg', compared with humanitarian logistics (Line. N. Tabbara, 2008, p. 21), as the latter includes all the operations and activities involved in commerce, in addition to other various activities that are related to the humanitarian operation. While customer satisfaction is a main target in commercial logistics, it is a matter of life and death when it comes to humanitarian logistics.

The complexity of the logistics concept in the relief field is more obvious than in the commercial one. This is reflected in the factor of time and the relative stability in the conditions being examined for the needs of the market and consumer to achieve a greater rate of accuracy that leads to success in the implementation of the commercial logistics operation compared to the relief logistics operation that deals with the disaster, whether a natural or man-made. Besides, the profit value differs, as commercial logistics depends on making profits, whereas relief logistics depends on minimising losses. So, as the customer and his needs differ, the mechanisms differ, too, radically despite of the agreement on the overall structure of the logistics concept as a term and a theory.

There is a great similarity between the humanitarian and military logistics concerning the unstable environment and the risk. Thus, humanitarian logistics can be described as a para-military operation as it is considered a special event occurring in an emergency environment. In contrast, commercial logistics is designed to set more routine procedures in an environment characterised by its more settlement, as repeated manufacturing (William K. Rodman, 2004).

So, we can say that humanitarian logistics are the specialised side of the humanitarian operation that deals with the operations of design, development, possession, storing, distribution, managing materials, maintenance, clearance and getting rid of materials and removing debris, moving the injured to hospital, founding services and administrating the information related to these activities.[1] 'They are described as applied systems including the coordinated integrated performance done by several specialised persons and organisations existed', (R.S. Stephenson, 1993, p. 9).

Logistics in the reality of its emergence is a transcendence of individual geniuses and experiences known to man at the time of adversity and in the military arenas to the stage of systematic and studied sciences. Possibilities, as the above shows us, the reality of the emergence of the logistical theory from the particulars toward the most integrated and complex generalities.

The Importance of the Logistic Support of the Humanitarian Relief Operations

In the aftermath of a disaster, whether natural or man-made, logistic support is considered the cornerstone in the response of governments, the international community and humanitarian organisations to complex emergency operations (Peter Tatham *et al*., 2008). The logistic support of humanitarian relief is the long, strong arm without which this relief is totally paralysed since partial failure in the logistics support field means an absolute failure in the operation.

Wars and disasters often leave behind a lot of destruction and devastation. They destroy the infrastructure of cities, including transport, communication, water and electricity systems, block roads, ruin bridges, seaports and airports, partially or totally. Wars and disasters also damage the local food stock and disrupt the normal production and distribution systems of goods and services, etc. This may result in impeding movement, loss of equipment and other factors that may weaken the local response capacity. These events may hinder the use of many of the local resources that are usually available as a pretext to obtain assistance. Moreover, the human groups, torn by armed conflict, become unable to lead a normal life. Consequently, they become in bad need of food and money. Thus, providing suitable logistic support is the lifeline that provides fast and effective intervention, reduces human losses, and promotes the feeling of solidarity.

The importance of logistic support appears in the effective role played by logistic support in all the stages of disaster management. Logistics are considered critical in deciding the size and speed of response. The humanitarian programmers that aim to providing healthcare, food, refuge, water and sewage mainly depend on the capacity of the staff of logistic support to manage purchasing, storing, transporting and distributing the supplies. This affects the schedule of these programmers, the method of implementation and many other aspects, which is why logistic support is an integral part of programme management (Thomas, Kopczak, 2005).

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[1] This definition derived from the military definition of the logistics, with some modification done by the researcher

Some specialists on humanitarian work believe that the logistic effort "makes up 80% of the relief operation, as logistics are a basic thing for this operation and it is the most expensive part in the response to the disaster" (Raminn Samii, 2008, p. 35). It is estimated that "At least 50 cents of each dollar of food aid are spent on transport, storage, and administrative costs" (Dugger C, 2005, p. 4).

Besides, the gross collections are large, and the collected information in this sector, after finishing the confrontation operation is considered very useful as acquired lessons, as logistic data reflects all the aspects related to implementation, e.g., the efficiency of suppliers and the transport producers, costs and the suitable time to respond and how suitable the donated goods are, and the management of information. All of this can be useful if other disasters occur in the future (Anisya Thomas, 2003, p. 4).

The growing quantity and levels of catastrophes, material scarcity, the race for funding, and the obligation for accountability together emphasize the significance of fast, fair, and safe Humanitarian Logistics (Khan, M., M. Khan *et al*., 2022, p. 3).

Logistic Activities Planning and Preparations

It is necessary to relate early between the general features of getting ready for facing the disaster and the logistic services. We must also get rid of the idea that logistics and other arrangements can be improvised according to the field conditions when the catastrophe occurs. Logistics should be the basic component of any national plan for responding to catastrophe, in addition to the individual plans of organisations and instructions such as schools and healthcare. Logistics should be closely related to all the operational activities within the context of emergent response to disasters (Humanitarian Supply Management 2001, p. 9-10).

The prior preparation operation in the logistic support requires prior knowledge of all the information of the country concerning the logistic system and the details of the infrastructure such as transport, communication and the necessary facilities that can be utilised, as stores and warehouses, knowing the capacity of seaports and airports, railways, potential needs, and the possible alternative resolutions.

This also includes the prior storing of some emergent supplies like food, medical supplies, tents etc. that help achieve quick response to disasters.

Humanitarian Logistics and the Effective Response Activities

The logistic support of the catastrophic events is considered the most important factor and the greatest problem that faces the humanitarian relief operation, too. In the confrontation stage, the humanitarian logistics need quick organisation under strict restrictions that depend on the condition of the logistic infrastructure in the affected region, the political factors, assessing the damage caused by the disaster and sometimes safety cases in the region, especially during the disasters that emerged from armed conflict. During operations, the managers of logistic services are to be the first to participate and the last to get out of the field.

Although the greatest interest is focused on the movement of goods and equipment (R.S. Stephenson, 1993, p9) the logistic support of humanitarian relief includes all the needed considerations for ensuring the effective and commercial support of the system throughout the planned life-cycle of the system that is related to the operations and systems caring for mobilising people, resources, skills, and knowledge that are needed to help (Thomas, A., 2003, p3) governments and humanitarian organisations in implementing

their programmes aiming at providing the basic requirements for the affected people to survive (www.fritzinstitute.org/Prsrm-htm.).

It also includes the emergent response activities of the operations of evacuation, searching, rescue and evacuation of the debris, e.g., moving the affected people of the disaster, alienating the injured people, the movement of relief workers, guiding the local cars to alienate the injured and the affairs related to transport and bus companies to help evacuation (Stephenson R. S., 1993, p. 9).

Humanitarian logistics, also known as disaster logistics is designed to cover the needs of vulnerable individuals, and to alleviate their suffering. Disaster logistics, preparation, planning, procurement, transportation, storage, monitoring and control, and customs clearance (S. Adiguzel 2019, p. 212).

Indeed, logistics serves as a bridge between disaster preparedness and response. Therefore, humanitarian logistics are crucial to the effectiveness, and speed of response for major humanitarian programmes (Roh Saeyeon *et al*., 2008, p. 2).

Humanitarian logistics usually use the structures and facilities of commercial and military logistics in their services, but the latter, when used in times of disasters emerging from armed conflict and civil war, are often considered dangerous and undesirable operation as humanitarian relief operations in running conflict zones is hazardous and runs the risk of politicising relief efforts.

Planning of Logistic Support

The concept of logistic support is considered closely related to operations, as logistics are nothing but an operation of planning preparation, implementation and evacuation for all tasks and activities supporting a certain operation or activity. It is a main component or one of the supporting factors that help the humanitarian programmes do their work, and that should be integrated into the decisions of planning and administration from the beginning to the end.

In general, an effective response plan consists of a group of integrated and relative factors that include direct works, founding human resources, specialists, information, and logistic support. Logistics support is a major factor in this operation, as direct businesses that are done by the humanitarian organisations such as providing the necessary needs for staying alive (the provision of clean potable water, food, sewage treatment, sanitation healthcare, refuge, protection, and security) or those emergency activities they perform (e.g., evacuation operations, search, rescue, and removal of debris). All these direct businesses depend mainly, in their inputs and outputs and operation, on the logistic support programmes which aim at providing the requirements of these programmes (purchases, transport, storing, and distribution till the goods are delivered to the end-user).[2] (cf. Figure 1) that shows the parts which make up humanitarian relief activities.

The first stage of the operations operation that is related to the logistic aspect should describe the tasks to be done to make a logistic system, and decide which link it will work with, and which sequence will be executed. Available resources and their suppliers should be included, besides how the progress is measured.

[2] Last mile: Delivery of goods to the final consumer who gets the relief

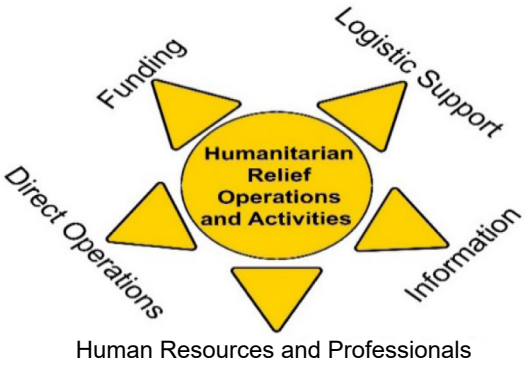

Figure 1: Logistic support and humanitarian relief operations and activities

The operations plan will need to clarify the aims and responsibilities needed to deliver the relief requirements according to the suggested timetable to achieve the aims. The plan should also clarify the methods by which the system and its control will be operated. All the plans of the logistics activities should be coordinated with the plans of relief operations of the other different sectors. These plans should care for the potential breakdown of the system by providing additional capacity, and alternative internal procedures. In cases of armed conflicts and the collapse of civil administration, flexibility is an urgent necessity (R.S. Stephenson, 1993, p. 9).

It is essential for the operations plan in the logistic support to concentrate on a group of points as follows:

- Assessing the damage caused to the infrastructure of transport and supply.
- Searching the potential aspects of the axes and centres of logistic distribution.
- Assessing the capacity of seaports and airports and roads networks, and deciding if they are capable of dealing with emergency cases and determining the needs.
- Emergency operation under different conditions.
- Analyzing governmental policies.
- Revising the plans of logistic support in the response stage (Iqbal, Q., K. Mehler & M. B. Yildirim, 2007, p. 5).

The Most Important Problems and Challenges Facing the Logistic in the Disasters Field

Managing disasters in general and logistic support in particular faces several problems and challenges that impede its work and adversely affect the whole humanitarian operation. In logistic support, some of these problems are related to the nature of logistics in general, like determining the optimised site to build a warehouse or distribution centre, the problem of determining the optimised roads for transport trucks and operation services, in addition to the problem of predicting the demand and the problems of stock, etc. The other problems are related to the nature of the relief operation and the complex surrounding environment. Disasters and wars are chaotic and damaging; it destroys the available infrastructure, induce a lack of information and equipment, and exacerbate weak coordination which makes dealing with emergency cases more complex. Under these chaotic conditions, logistics is the biggest challenge that relief operations face. From prior planning to execution, the disaster usually comes as a surprise and developments on the ground are usually unpredictable and fluid. Then, usually, a gap occurs, and this gap is representative of the lack of logistics services.

The biggest problem and greatest challenge that relief operations face in general and in the humanitarian logistics sector in particular is with the system itself that tries to replace one that is about to collapse or has already collapsed. This saddles relief workers with weak facilities and doubles the resource needs in an already complex environment that is usually a hazardous and hostile to environment. Disasters have a distinct nature as each is different in its characteristics and conditions. It is a special case; every time, nevertheless we can extract some common features of disasters.

We can set the most important problems and challenges that are faced by the logistics support crews as follows:

- Multiplicity of actors in the relief operation, and may create a problem in coordination among them.
- Arrival of great amounts of aid to the affected parts either from the state or from other countries, and lack of logistics system that can be enough to control the flow of this aid, especially in the developing countries.
- Regions and points of the arrival of supplies such as seaports and airports and borders may become bottlenecks.
- The rareness of storage places and their equipment and shortage of transport means, or the difficulty of getting them or that they are not available at all.
- Time factor and the urgent needs of the victims, and the pressure of strong public opinion.
- Lack of field information is considered one of the most important problems facing disaster management operations.
- Security factor, especially during armed conflicts and civil wars, as the staff of relief and the workers in the humanitarian field are often exposed to the danger of being targeted for those conflicts and wars. This may hinder the relief efforts.
- Some supplies and relief materials are exposed to theft, looting, or control by the conflicting groups.
- It is sometimes difficult to reach the affected areas, or communicate with them in a race against time.

In the case of disasters that emerge from armed conflict and civil wars, the relief organisations in the United Nations find difficulty in dealing with the parties in conflict, especially when some of these parties are considered illegitimate or terrorist organisations or countries.

Conclusion and Implication

Encountering a disaster and preparing for it requires a practical and systematic effort prior to the accident leading to the disaster. It is also necessary to have emergency plans in place which are based on large databases comprising all that is relevant to the disaster and logistics necessary. Pre-planning is also required to learn how to mobilise available capacity and how to deploy this to the site in time so that the situation is not aggravated, and the negative impact is minimised. Efforts should then focus on containing the disaster impact and causing things to return to normal. Logistics help create a feeling of solidarity, mitigate the disaster effects, and help the affected people to survive by providing them with the basic necessities. Logistics can also reduce the loss of physical resources, time, and human life.

The science of disaster management and managing relief logistics is one of the many sciences. It has tangled relations with a lot of other sciences and knowledge such as sociology, politics, geography, and others.

An incomplete understanding of these sciences leads to significant losses. Thus, desirable results are not achieved, so, the problem is embodied in the structure's magnitude and the divergence of experience or difference specialisation. This leads to an increase in the accuracy, sensitivity, complexity, and danger of the operation and even a partial failure of logistics support in relief operations could mean the total failure of the operation.

Relief logistics is chiefly concerned with anthropology before being a science that deals with natural and military events or the

science of transport and supplies based on numbers, mathematics, and statistics. It is also the science of possibilities, as it clarifies what was prior to the emergence of the logistic theory from molecules to the complex and integrated whole. The science of logistics is still in its nascent stages, which we have barely begun to codify. It is a promising science that promises to improve the effectiveness, ability and agility of logistics providers to deal with surprises, whether natural or man-made; it is a science that will, one day, influence and control outcomes of relief work against the vagaries of nature and man.

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