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ORIGINAL PAPER

HUMANITARIAN LOGISTICS AND SUPPLY CHAIN MANAGEMENT-A QUALITATIVE STUDY

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ABSTRACT. **Background:** A common goal of Humanitarian Organizations (HO's) is to deliver the services to humanity in a spirit of impartiality and neutrality without any discrimination. HOs primary functions are remained to deal with disasters, to protect human rights, to provide relief services and promote the universal desire for personal and collective safety, security, respect, and dignity without any view to profit. Logistics and supply chain management operations of HO are known as most expensive part and required sustainable solutions. HOs must utilize their funds effectively and efficiently. In this study we reviewed previous studies and identified areas needing further improvements in Humanitarian Organizations Logistics and Supply Chain Management (HO-LSCM) system.

Methods: Focusing on HO effectiveness and efficiency, this study identified and categorised the HO-LSCM articles into five broad areas: the concept of HO-LSCM, challenges and issues in HO-LSCM, HO performance management, HO effectiveness and efficiency management, types of research and research methodologies adopted in that research. Based on these categories the notable gaps in the existing studies were identified and recommendations for future research suggested.

Results: Existing studies are focused on Effectiveness, applying organizational agility in management, while Efficiency in management, under the heading of Lean Management, is an underdeveloped area which needs further extension to better serve the maximum number in society. Notably, 94% of HO-LSCM studies are based on qualitative research and most of them developed theoretical frameworks which have not been tested and adopted widely. In management of humanitarian organizations logistics and supply chain operations, every HO has varied policies and procedures, thus, standardization is required to streamline the effectiveness and efficiency in logistics and supply chain functions.

Conclusion: This qualitative research study is the first that has reviewed the field of HO-LSCM in terms of Efficiency and Effectiveness, and where prior studies have applied concepts of organizational agility and lean management. We have sought to extend this thinking in regard to Lean Management as it enhances Efficiency in management.

Key words: Humanitarian Organizations (HOs), HO Logistics and Supply Chain Management (HO-LSCM), Effectiveness & Efficiency (E&E), Agility and Lean Management (A & LM).

INTRODUCTION

The concept of humanitarian organizations (HOs) has ancient roots and is admired in both Western and Eastern civilizations. In 1859 during the Second Italian War of Independence, Henri Dunant witnessed the battle of Solferino, and he took action to treat the soldiers who were suffering in the battle. Dunant is credited as the founder of modern humanitarianism and the founder of the International Red Cross and Red Crescent Movement [Bürger 2015]. A common theme of HOs is service to humanity in a spirit of impartiality and neutrality without discrimination. The abiding prime objectives of HOs are to deal with disasters, to protect human rights, to provide relief services and promote the universal desire for personal and collective safety, security, respect, and dignity without any view to profit [Doyle, Gorman, Mihalkanin 2016]. HOs are highly dependent on their logistics and supply chain management which represents approximately 80% of total relief budgets [Kent, 2004, Van

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Wassenhove 2006]. Thus sound, knowledgeable management of logistics and supply chain operations is vital to the successful achievement of HO objectives. Humanitarian Organizations Logistics and Supply Chain Management (HO-LSCM) operation cost is known to be approximately 25% higher than comparable business supply chain management operations [Whiting, Ayala-Öström 2009]. The reasons for this are complex and can involve such factors as inherent uncertainty, limited local use of technology, human resource difficulties, and poor infrastructure [Antai, Mutshinda, Owusu, 2015].

Over the last twelve years, HO-LSCM research has drawn extensive interest for the purpose of improving HO operations. However, HO-LSCM research has generally not yet reached the advanced level of research into business logistics and supply chain management. Today humanitarian organizations are coming under increasing competition from United Nations humanitarian agencies, for-profit organizations and government departments to deliver humanitarian services utilizing scarce funding resources [Oloruntoba, Gray 2009, Scholten, Sharkey Scott, Fynes 2010]. Donor funding behavior is shifting from "project based" toward "performance based" disbursement of funds, in which only with the submission and successful evaluation of activity completion reports will donors release funds to HOs, and only for activities deemed achieved. In this environment of increased competition and pressure from performance-based funding, the importance of efficiency in HOs is quickly catching up with the traditional emphasis on effectiveness. Thus, this study reviews existing HO-LSCM research, focusing on HO operational efficiency and effectiveness.

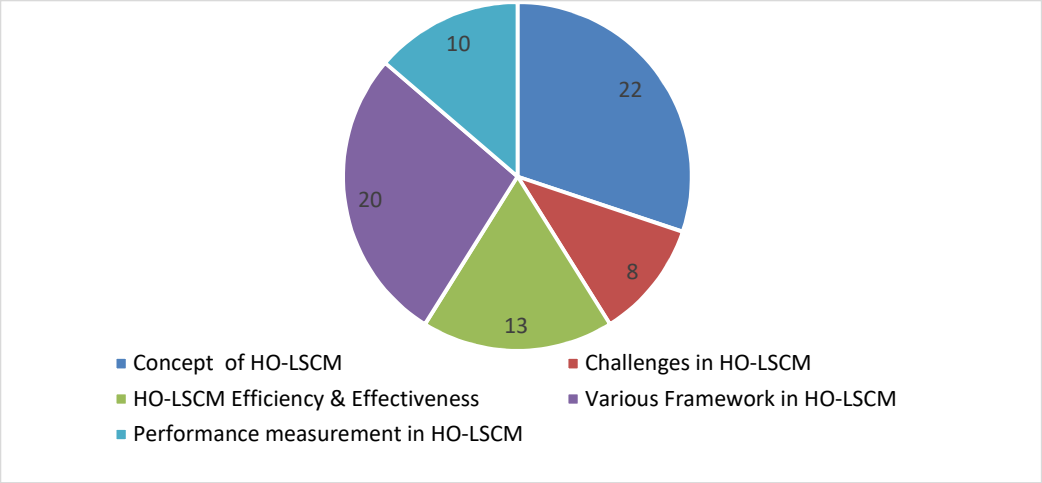

Fig. 1. Major categories of reviewed articles. (Numbers indicate how many review articles are in each category)

Using the key words "humanitarian logistics", "humanitarian supply chain management", "humanitarian operations management", "humanitarian supply chain agility and lean management" and "humanitarian supply chain efficiency and effectiveness", 73 peer reviewed published articles have been identified and analyzed. In this study, systematic and categorical analyses have been conducted on a number of questions, including broad concept of: "What is the concept of HO-LSCM?" and "What are challenges and issues in HO-LSCM?". Specific concepts that this study focuses on include: "What relevant models or frameworks have been developed and tested?", "What tools have been developed for HOs performance measurement?", "What measures have been taken to improve HO operational efficiency and effectiveness?", What types of published research on HO-LSCM exist?" and "What types of research methodology have been adopted?". The primary purpose of this study is to identify some notable gaps in existing research that future studies could address. To answer the above questions, the reviewed

literature is divided into the following five major categories: 1) Concept of HO-LSCM, 2) HO-LSCM issues and challenges 3) Performance of HO-LSCM, 4) Construct models/frameworks in HO-LSCM, and 5) Efficiency and Effectiveness in HO-LSCM. Figure 1 presents all the articles reviewed in this study, divided into these five categories.

THE CONCEPT OF HUMANITARIAN ORGANIZATION LOGISTICS AND SUPPLY CHAIN MANAGEMENT (HO-LSCM)

Humanitarian Organizations Logistics and Supply Chain Management (HO-LSCM) processes are almost identical to those of corporate logistics and supply chain management, however HO-LSCM does not involve the process of manufacturing goods. The term Humanitarian Supply Chain Management (HSCM) is defined as coordination and integration of various internal and external stakeholders [Cozzolino 2012], while the term Humanitarian Logistics Management (HLM) is defined by the Council of Logistics and Supply Chain Management as the moving of goods, information, and services from point of origin to final destination [Cozzolino 2012]. Supply chain management is focused on relationships among the stakeholders that make logistics movement possible and is recognized as crucial to properly carrying out any disaster response [Cooper, Lambert, Pagh 1997, Cozzolino 2012]. After gathering the viewpoints of various HO-LSCM professionals, the Fritz Institute (a humanitarian logistics services specialist organization) has defined Humanitarian Logistics Management as "the process of planning, implementing and controlling an efficient, cost-effective flow and storage of goods, materials, and related information from the point of origin to the point of consumption for alleviating the suffering of vulnerable people".

Thus, HLM involves many functions including preparedness, planning, procurement, transport, warehousing, tracking, tracing, and customs clearance from point of origin to point of consumption. HLM is also known as a process or system which involves applying knowledge and skill to mobilize resources and people with the purpose of helping vulnerable and affected communities [Van Wassenhove 2006].

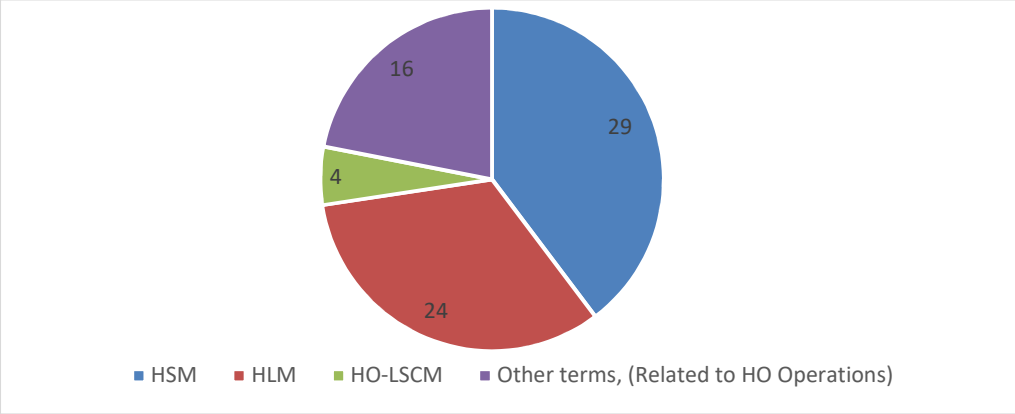

Fig. 2. Reviewed papers grouped by their use of related terms

Some of the authors argued that logistics is a part of supply chain management used to plan, implement, and control the efficient, effective forward and reverse flow and storage of goods, services, and related information from point of origin to point of consumption in order to meet the customers' requirements [Bhimani, Song 2016, Blecken 2010, Overstreet, Hall, Hanna, Kelly Rainer 2011, Van Wassenhove 2006]. However, the literature review of 73 HO-LSCM articles revealed that the terms "Humanitarian Logistics" and "Humanitarian Supply Chain Management" are for the most part used interchangeably, the definitions and functions of both terms overlapping. One study also

revealed that the formal job titles of most HO professionals are some variation of "Logistics Director, Manager, Officer", etc. while some organizations name the same role as "Supply Chain Director, Manager, Officer", etc. However, there is no difference in the required skills for the two types of job titles [G. Kovács, Tatham, Larson 2012]. In this matter of nomenclature, there is no uniformity even in academic research. Most studies use "HSCM" in their title, and some of them use "HLM". However, it is rare to distinguish between the two terms in a single paper and treat them separately. A breakdown of the reviewed papers by their use of the terms HLM, HSCM, both HL-SCM and Other Terms related to HO operations is seen in Figure 2.

CHALLENGES AND ISSUES IN HO-LSCM

Authors have identified a variety of challenges typical for HO-LSCM, including assessment and planning problems, limited use of technology, remote and rustic locations of operation and lack of infrastructure [Chandes, Paché 2010, Overstreet et al. 2011, Sandwell 2011]. One notable challenge pointed out is that donor spending behaviors can be short-sighted and superficial. In other words, donors tend to be more willing to provide money for visible or tangible outcomes rather than for preparedness or development of logistics and supply chain management systems [Whiting, Ayala-Öström 2009]. Overstreet et al., [2011] identified the major challenges of HO-LSCM as often having to deal with unknown demand, short delivery time, unexperienced logistics staff, awkward media pressure, lack of funding, insufficient equipment and technology, and inappropriate political interference.

Differences in interpretation of knowledge between practitioners and academics are also a challenge which can affect problem solving approaches and the use of qualitative and quantitative evidence [Jha, Acharya, Tiwari 2017]. As an example, the use of 4WD (4-wheel drive) vehicles in HO fleets to overcome routing problems is an academic sort of recommendation, however in local communities the use of 4WD vehicles is commonly interpreted as an ostentatious display of wealth and power, and awareness of this interpretation and its consequences only comes from practical experience. Thus, academic knowledge and its practical implications in the field are often different [Jha et al. 2017]. HO efficiency and effectiveness requires dealing well with a wide variety of HO-LSCM challenges and contributing in a positive manner to the delivery of humanitarian services to the community in need. Some other challenges that can be a destabilizing influence on humanitarian aid are socio-political factors such as kinship ties, nepotism, patronage, and other similar soft barriers. Some harder barriers may be degraded infrastructure, unreliable communication systems, road blockages and various security issues. These HO-LSCM challenges have been divided into four major types: planning and assessment challenges, operational challenges, collaboration and standardization challenges, and monitoring and control challenges, and these can be seen in Table 1.

The reviewed literature showed that the first three types (Assessment and planning challenges, Operational challenges, Collaboration and standardization challenges) of challenges have drawn more attention in the research field, whereas the last type (monitoring and control challenges) has not garnered the same level of interest and still holds much potential for future research and development for HO-LSCM efficiency management. The literature also revealed that HO-LSCM relevant challenges are often discussed in the same terms as the disaster management cycle (i.e. preparedness, response and recovery). This brings up an important point. Disaster management is only one aspect of the many kinds of work handled by various HOs. HOs also do vast amounts of development work in areas such as education, long term health care, economic development, and poverty alleviation. The challenges faced by these other operations end up being ignored and not addressed to the extent of disaster management issues.

Table 1. Humanitarian Organization Logistics and Supply Chain Management (HO-LSCM) challenges

Type of Challenges	HO-LSCM Challenges	References
Assessment and planning challenges	Pre-occupation with response	Overstreet et al., 2011; Sandwell, 2011)
	Lack of logistics expertise and logistics capacity building program	(Oloruntoba, Glenn Richey, & Gray, 2009; Overstreet et al., 2011; Sandwell, 2011)
	Different nature of disasters	(Sandwell, 2011; Van Wassenhove, 2006)
	Unknown demand	(Overstreet et al., 2011; Van Wassenhove, 2006)
Operational challenges	Remote and rustic region of operations	(Chandes & Paché, 2010; Sandwell, 2011; Van Wassenhove, 2006)
	Ineffective management and tools and techniques	(Sandwell, 2011; Van Wassenhove, 2006)
	Lack of technological involvement	(Chandes & Paché, 2010; Overstreet et al., 2011; Sandwell, 2011)
	Degraded infrastructure	(Chandes & Paché, 2010; Sandwell, 2011; Van Wassenhove, 2006)
	Uncertainty	(Overstreet et al., 2011; Van Wassenhove, 2006)
Collaboration and standardization challenges	Little appreciation for logistics staff	(Sandwell, 2011)
	Low status & limited influence of logistics staff	(Sandwell, 2011)
	Work pressure, high stress	(Sandwell, 2011)
	High turnover of logistics staff	(Oloruntoba et al., 2009; Sandwell, 2011)
	Lack of career path	(Overstreet et al., 2011; Sandwell, 2011)
	Humanitarian culture and ethics	(Sandwell, 2011)
	Lack of standardized processes	(Overstreet et al., 2011; Sandwell, 2011)
	Difference between academic research and practical implications	(Jha et al., 2017)
	Competition for new staff in emergencies	(Sandwell, 2011; Van Wassenhove, 2006)
Monitoring and control challenges	Humanitarian ethics and political interference	(Overstreet et al., 2011; Sandwell, 2011)
	Poor accountability	(Chandes & Paché, 2010; Oloruntoba et al., 2009)
	Lack of performance management of both the system and staff	(Sandwell, 2011)
	Focus on output instead of outcomes	(Sandwell, 2011; Whiting & Ayala-Öström, 2009)
	Donor influence & funding issues	(Oloruntoba et al., 2009; Overstreet et al., 2011; Sandwell, 2011)

HO-LSCM MODELS, FRAMEWORKS, AND THE THEORIES BEHIND THEM

Humanitarian Organization Logistics and Supply Chain Management (HO-LSCM) research is found to focus on a large extent on the development of various fundamental models or frameworks that, although illuminating important major structures, are not usually fleshed out and do not yet address practical implications in the actual field. This shows that research on HOs is still a relatively new and emerging field of academia. Out of the 73 reviewed articles, 27 of them were found to directly address concept-based models and frameworks. The identified frameworks have been divided into three major groups, namely: HO-LSCM assessment and evaluation, business and HO integration and HO-LSCM operations. Numbers of studies found in each group are presented in Figure 3.

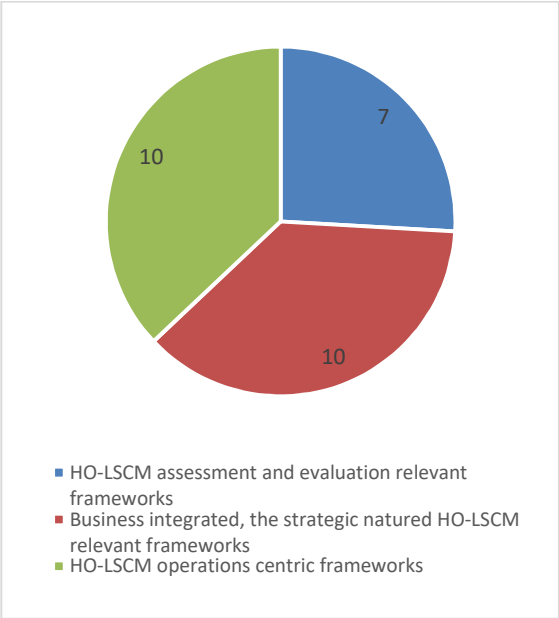

Fig. 3. Framework groups and their number of constituent articles

Framework Group 1: HO-LSCM Assessment & Evaluation

The ability of a humanitarian organization to assess its own performance is vital for gradual improvement of the organization [McLachlin et al. 2009]. Different researchers have proposed many different methods for HO performance assessment. For example, Schiffling and Piecyk [2014] use the Balance Score Card (BSC) business model to identify HOs various stakeholders and their values, and then check if those values are being met by the HO. Some of the main values which identify for HO stakeholders are: reliability, quality, timely delivery, transparency, efficiency and effectiveness [Schiffling, Piecyk, 2014]. Another system for assessing HO performance comes from Helmig et al., [2015] who identify an organization's competitive advantages and then use those to determine the HOs performance. For instance, organization's competitive advantages could be a sense of destiny, trust in goodness, altruism, equality, self-respect, humanity, quality, innovation, competitiveness and efficiency [Helmig, Hinz, Ingerfurth 2015].

Antai et al. [2015] have a completely different approach: the idea that an HO's performance can be measured by compiling and analyzing the failures of that HO. They introduced and tested the HO-LSCM Failure Measurement Framework, which is based on the "3R" factors: Right goods, Right time and Right place. Using linear equations, the authors used a computer to apply simulated data and proved that these 3R factors are accurate indicators of HO performance [Antai et al. 2015]. Another model comes from Beamon and Blacik, [2008]. In Beamon's model, HO-LSCM performance can be measured by identifying and quantifying three specific metrics: "Resources", "Output" and "Flexibility". In the case of HOs, the Output metric is quite different from the Output metric of a business, due to the non-profit goals of HOs. In other words, the Output of a business is how much profit they make, but for an HO, the Output might be how many people they are able to assist and how quickly they can deliver that assistance [Beamon, Balcik 2008]. Although the assessment frameworks in this group have completed development, few of them have been well tested or widely adopted. No framework was found that could assess an HO-LSCM adherence to standards like Humanitarian Spheres or ISO.

Framework Group 2: HOs Partnering with Businesses

The strategic goals of managing HO-LSCM through business partnerships are to reduce operational costs and to improve the delivery of humanitarian services [Beamon, Balcik 2008]. The benefits of an HO partnering with a business can include accelerating the flow of material and information, decreasing inventory levels and lowering supply chain management costs through consolidation [Vojvodic, Dujak, Plazibat 2015]. A successful partnership between an HO and a business often involves three basic principles: to identify and understand the factors which affect the partnership, to understand the suitability and requirements of the partnership and to continuously measure partnership performance on the basis of output and outcomes [Nurmala, de Leeuw, Dullaert 2017]. There are three basic functions of a partnership: transaction management, event management, and process management [McLachlin, Larson 2011]. The goal of transaction management is timely resolution of operational issues (e.g. expediting late deliveries). The goal of event management is joint planning and decision making about specific events, e.g. identifying where supply chain disruptions or bottlenecks may occur. Process management refers to coordinated management of both demand (downstream) and supply (upstream) processes [McLachlin, Larson 2011].

Corporate businesses also face pressure to develop Corporate Social Responsibility (CSR) particularly since corporations are often voracious consumers of natural resources [Bealt, Fernández Barrera, Mansouri 2016, Maon, Lindgreen, Vanhamme 2009, Rueede, Kreutzer 2015]. Business corporations can learn about social responsibility from HO professionals as well as concrete skills such as quickly entering and coping with the difficult environment of front line relief operations as well as the sharing of government, community and military networks in case of disasters [Kusumasari, Alam 2012, Lu, Goh, De Souza

2013, Pettit, Beresford 2009, Thomas, Fritz 2006].

Examples of HOs Partnering with Businesses

Formation of HELP (Humanitarian Emergency Logistics Program) between the company Agility Logistics and the HOs named IMC and WEF is an example of a partnership for delivering emergency products in cases of disaster. Another example of an HO-business partnership is the formation of Logistics Emergency Team (LTS) for delivery of humanitarian services by the private sector companies, e.g. TNT Logistics, Agility Logistics and UPS Logistics. LTS makes their services available to a variety of HOs, and says they are capable of responding to any disaster within 48 hours in any part of the world [Vojvodic et al. 2015]. A partnership between the company DPDHL and the HO UN OCHA has proven helpful to solve issues related to delivery bottlenecks and the arrival of unsolicited relief items at airports. Through this partnership, UN OCHA improved effectiveness of humanitarian distribution networks [Rueede, Kreutzer 2014]. A partnership between American Red Cross and Abbot Laboratories is another example of a cross sector partnership, one which has increased the visibility of HO supply chain management [Thomas, Fritz 2006].

Through cross-sector partnerships and coordination, HO-LSCM performance can be enhanced and a close relationship can be fostered between the two parties. Cooperation and coordination of the HO, corporate and government sectors can improve the management of disasters and can also increase overall awareness and preparedness to better deal with subsequent disasters. In conclusion, the concept of building partnerships between HOs and private sector businesses would lead to better coordination, and increased effectiveness and efficiency [McLachlin, Larson 2011].

Most of the reviewed literature within this group of framework has recommended partnerships between HOs and private businesses and provided some case studies, however none of the reviewed literature provides a comprehensive, standardized model for such partnerships, a model which can assist HO leadership in deciding which of their various operations, or specific activities within those operations, they would best ask the business partner to handle in order to maximize effectiveness and efficiency in the HO's logistics and supply chain. Moreover, the literature has discussed examples of successful partnerships but no examples of unsuccessful partnerships from which one could learn the reasons for failure as well as helpful lessons applicable to future partnerships.

Framework Group 3: Emphasis on Inventory, Transportation, and Procurement Management Operations

HO-LSCM operations have no defined or standardized scope, but they usually consist of the inventory operations, procurement operations, and transportation operations of the HO. Within these three types of operations, each is greatly influenced by various stakeholder's circumstances, as well as by current political and economic conditions, all of which can influence the HOs efficiency and management decisions [Merminod, Nollet, Pache 2014]. The frameworks developed for each of the three main HO-LSCM operations are described below.

Inventory operation management models

The most effective, most efficient response to any disaster is made possible by intelligent pre-positioning of inventory and optimum allocation of resources [Merminod et al. 2014]. Jha et al., [2017] introduced a multi-faceted model within HO-LSCM to optimize inventory practices through careful, methodological analysis of supply and demand, factoring in the risks of either supply or demand being too high or too low. Optimization is determined using mathematical equations, and the results are analyzed through a "non-dominated sorting genetic algorithm-III" program. Jha et al.'s study focused on the example of optimizing disaster related inventory such as food, medicines and other basic relief items [Jha et al. 2017]. To gain the benefits of prepositioning inventory, a group of HOs have developed shared centralized depots called "United Nations Humanitarian Response

Depots (UNHRD)" for pre-positioning of contingent inventory to respond to disasters worldwide. The depots have been established at six different locations: Brindisi, Italy; Dubai, United Arab Emirates; Panama City, Panama; Kuala Lumpur, Malaysia; Accra, Ghana and Las Palmas, Spain. The UNHRD partners claim that this strategy of centralized depots and inventory pre-positioning enables them to respond to any disaster anywhere in the world within 24 to 48 hours [Dufour, Laporte, Paquette, Rancourt 2018].

The important point derived from the literature review is that most of the HO inventory management operation studies discuss the various aspects of disaster management operations, while aspects of normal (non-emergency) operations are rarely explored, which is an important research gap revealed by this literature review.

Transportation operation management models

Delivery of humanitarian services to beneficiaries is one of the most critical operations of HO-LSCM which known as last mile delivery [Balcik et al. 2008]. The focus of last mile delivery is the fleet system used to transport the goods, material and people [Apte 2009]. For HOs, fleet management is the second largest overhead cost, being 15% of the total humanitarian relief logistics cost [Falasca, Zobel 2011, Martinez, Stapleton, Van Wassenhove 2011]. Plans and policies on sourcing and allocation of vehicles by HOs can be suddenly rendered irrelevant on real grounds: the occurrence of natural disasters usually cannot be predicted. This is the nature of such disasters, and local, social, political, safety and security scenarios for the relief mission demands different types of vehicles: heavy duty equipment, 4WD vehicles, or light duty vehicles. In one case study, most of the vehicles were not usefully deployed according to the demands of that HO's mission because 95% of the vehicles were light duty, and not useable [Eftekhar, Van Wassenhove 2016].

Efficient and effective fleet management and distribution systems are highly dependent on selection of an appropriate route. [Dufour et al., 2018] developed a computer simulation for optimization of transport routes which recommended a new route for delivery of relief supplies from UNHRD to East Africa. Using the new route was 21% less expensive than using the existing route. This showed that emergency operations transportation is more difficult to plan and implement than usual, every-day, reconstruction and developmental operations are. Thorough preparedness, coordination and well-informed information systems can overcome these problems to a great extent, however [Berkoune, Renaud, Rekik, Ruiz 2012].

This study found that the literature focus was on emergency fleet or transportation management, and normal and developmental operations fleet management has not been addressed to any great extent. As well, existing research is often relevant to utilization and management of HOs owned vehicles resources, and out-sourcing of fleet management as an efficiency and optimization strategy is a largely ignored area.

Procurement operation management models

Procurement in HOs is the acquisition process of goods, services, works, and leasing during and after a disaster, to enable the distribution of aid to affected and vulnerable communities. In HO-LSCM budgets, 65% is spent on procurement activities [Falasca, Zobel 2011]. Efficiency in expending the procurement budget can be ensured through transparent and accountable management of the various stages of the procurement process, including identification of needs, requisition of needs, announcement of tenders, evaluation of tenders, purchase orders, delivery of supplies, inspection of supplies, and payment to vendors etc. [Falasca, Zobel 2011]. Transparency and accountability in HO-LSCM procurement operations can be ensured through information technology and standardization of overall procurement processes [Falasca, Zobel 2011].

A standardized procurement process framework has been developed for the bid announcement, bid construction and bid evaluation phases. The bid announcement phase is considered more challenging for HO professionals and requires careful development of criteria for deliveries, timing, and bid evaluation. While subject to an unstable

environment and the impact of a disaster, suppliers should take decisions to construct their bids in keeping with required place of deliveries, timeframes and other essential requirements [Trestrail, Paul, Maloni 2009, Ertem et al. 2010]. HO-LSCM operations should therefore include standardized processes of procurement of goods and services, information management, written documentation, financial management, warehousing and inventory management logistics and fleet management, and coordination between stakeholders [Blecken, Tatham, 2010]. Another HO-LSCM procurement framework also recommends that emergency goods, supplies, and services be procured from local markets which are likely to provide faster and more timely delivery, and will be efficient in price due to savings in transportation costs [Falasca, Zobel 2011].

The success of HO disaster operations is dependent on timely delivery of goods and supplies, which is possible through good relationships with potential suppliers. HOs maintaining good relationships with short term engaged suppliers as a cost efficiency driver is another gap in the research. This is a difficult area of activity for HOs, given the often-large number of local suppliers that need to be involved, and ensuring best-cost of goods and services from these local suppliers is both essential, and difficult. Especially, procurement operations relevant to normal humanitarian operations are underexplored, particularly when compared to research that has been done on emergency phase procurement operations.

Within our Framework Group 3: Emphasis on Inventory, Transportation, and Procurement Management Operations, the literature review in this study revealed that every operational and donor organization has their own procurement policies and required procedures. This is a challenge for HO-LSCM in maintaining transparency in the execution of their logistics processes. The question must arise, that, if the purpose of every organization is to provide relief to the needy and to vulnerable communities, then why are the processes of each organization so different and complicated. A study shows that 71% organizations have different processes relevant to the same type of operations. Of 100 organizations studied, only 20 had comprehensively reviewed their policy documents, while 32 of those organizations had some sort of the documented processes, and the remaining 48 had no written documented policies for operations management [Blecken, Tatham 2010]. The major focus of previous research has remained on HO-LSCM effectiveness, and efficiency in management gained only rare attention.

HUMANITARIAN ORGANIZATION PERFORMANCE MANAGEMENT

In the realm of business, performance can be measured through customer satisfaction which can be achieved through strong relationships with the customer and with all other involved parties. In business, the concept of the customer is a person whose needs are meet by suppliers, vendors, or sellers in exchange for payment in one form or another [Kendall 2006, Philp Kotler 2012]. Transferring the above concept to application within HO-LSCM, there are two different kinds of customers: one is the donor, and the second is the beneficiary. The donor can be viewed as an "upstream" customer who provides funding to HOs, while, the beneficiary or community can be seen as a "downstream" customer, for whom resources are being spent by the HOs [Antai et al. 2015, Oloruntoba et al. 2009]. Due to the financial dependency of an HO on its donors, these upstream customers tend to wield more influence and negotiation power in an HO than the downstream customers do [Antai et al. 2015]. However, the HO's performance is critically dependent on the satisfaction of both the donor and beneficiary, and this is achievable through timely provision of quality goods and services to beneficiaries in a transparent and accountable way [Oloruntoba et al. 2009].

As mentioned above, HO-LSCM is involved in two fundamentally different kinds of work. The first is disaster management, which includes preparing against, responding to, and rehabilitating after disasters that affect communities, and the second is long-term development projects related to sustainable

development goals such as economic development, education, health, energy, and equality. This brings up another important point. The performance of disaster management related operations is largely a measure of effectiveness (i.e. prompt assistance to the beneficiaries), while the performance of development related operations is instead a measure of efficiency (i.e. cost minimization and sustainable resource consumption).

Significantly, this literature review reveals a striking gap in existing HO-LSCM research: there are insufficient tools for measuring performance. Although assessment of effectiveness has drawn the attention of some researchers [Charles, Lauras, Van Wassenhove 2010], studies of HO-LSCM efficiency have been comparatively few and inadequate.

EFFECTIVENESS AND EFFICIENCY

HO-LSCM effectiveness management is defined by rapid delivery of humanitarian goods, services and any other relief items, in minimum time [Cozzolino 2012]. HO-LSCM efficiency management encompasses the ability to minimize the wastes, avoid redundancy and duplication of activities, conserve energy, and maximize effort while minimizing time taken and overall operational costs [Provan, Kenis 2008]. Efficiency means "doing the thing right," whereas effectiveness means "doing the right thing" [Provan, Kenis 2008]. In HO-LSCM, Effectiveness is conceptualized as “agile management”, while efficiency is conceptualized as “lean management” [Christopher, Towill 2001, Cozzolino 2012]. Both effectiveness and efficiency of the HO’s processes and actions can be achieved through the most common practices which often can provide a solution to 50% of any problem. These common practices include development of a standard set of guidelines, training syllabi, certification processes, process alignment, especially with appropriate IT systems [Tatham, Spens, Kovács, Payne 2013]. The most basic factor affecting the effectiveness and efficiency of a HO-LSCM is strong coordination between the HO and its stakeholders [Tatham, Spens, 2016]. To meet the HOs common goal, various such organizations have developed their clusters of cooperating and coordinating organizations for the provision of humanitarian services. Some examples of such clusters are: the UN logistics cluster, the international search and rescue group (INSARAG), and the urban search and rescue group (USAR) [Tatham, Spens 2016].

In HO supply chain operations, the “Plug and Play” concept, whereby processes and actions can be immediately instituted in an emergency situation, particularly temporary supply chain management (TSC) processes, is only possible through a well-coordinated, efficient and effective flow of information [Merminod et al., 2014]. During the humanitarian response, prioritization of needs is the most important factor for assessment of required resources, implementation of immediate solutions and to decide on the necessary shift from the effectiveness management to efficiency management [Merminod et al., 2014, Tomasini, Van Wassenhove, Van Wassenhove 2009]. Thus, humanitarian organizations need to prioritize these demands and to implement an immediate solutions as per available resources [Tomasini, Van Wassenhove, 2009].

HO-LSCM effectiveness ensures that time is saved, which means more lives saved, while HO-LSCM efficiency ensures that cost savings, which means more lives (peoples) are helped [Cozzolino 2012]. In the humanitarian sector, the often-made complaint is most of the delivered aid does not reach its customers at all, or reach the customer in an unusable condition. Lessons learned from the corporate world can benefit humanitarian organizations in well designed and practiced business policies, appropriately customized for humanitarian operations, will both save lives and help lives. Especially with the application of contemporary IT solutions, standardizing of systems such as backordering, shrinkage, spoilage policy, use of last mile delivery can be optimized, using linear and dynamic programming [Bhimani, Song 2016]. The Lean and Agile paradigms are good for enhancement of competitiveness, cost efficiency and time effectiveness in the HO sector [Kovács, Oloruntoba, Gyöngyi 2015, Gligor, Holcomb, 2012, Ismail, Sharifi 2006].

In the literature, effectiveness, which is considered as Agile Management, has been given more attention, presumably due to the nature of disasters; suddenness, urgency, seriousness, and therefore of the nature of the demands on HOs; meeting emergencies has been seen as the normal situation in which HOs find themselves. Efficiency (Lean Management) has not been explored in any detail in academic and professional research areas. Again, it can be presumed that this is the case due to the nature and scope of HOs disaster management. There has been a perception that normal is not normal, as in not day-to-day, in these operations, so researchers have not given equal importance to the efficiency of the overall HO-LSCM operation.

Agility management in HO-LSCM

According to the international consultancy, McKinsey and Co, "Agility is the ability of an organization to renew itself, adapt, change quickly, and succeed in a rapidly changing, ambiguous, turbulent environment. Agility is not incompatible with stability—quite the contrary. Agility requires stability for most companies". The concept of organization agility, stated as Agile Management (or agility management) arose in the early 1990s, defined by a group in the research institution, the Iacocca Institute, Lehigh University [Rahimnia, Moghadasian 2010, Ramesh, Devadasan 2007]. Agility in management is seen as using market knowledge and, in more recent times, computer technology and networks, to exploit profitable opportunities in volatile marketplace [Naylor, Naim, Berry 1999]. Agility is a holistic and strategic idea and a "business-wide capability", shedding light on all aspects of a supply chain, including internal organizational structures and trade partners. The most important prerequisite to achieving agility is the development of a culture compatible with the agile enterprise. That is, the people side of the supply chain [Aitken, Christopher, Towill 2002, Christopher, Towill 2000]. The key to being agile is at the service level; flexibility and responsiveness, which, together are the market winner characteristics of an agile supply chain, as distinct from cost considerations, which are the market winner characteristics of leanness.

Agility in logistics and supply chain management is defined as the capability of flexibility in the various supply chain management processes; the procurement processes, distribution logistics processes, and manufacturing processes [Charles et al. 2010]. The flexibility capabilities are classified into four categories: volume flexibility, delivery flexibility, mix flexibility, and production flexibility [Slack 2005]. In supply chain management processes, when lead times are long, and demand is unpredictable, agility management techniques should be applied [Christopher 2005].

The humanitarian sector is well known as being expert in agility management by applying various techniques for contingency planning and pre-positioning of inventory. Other techniques recommended for HO-LSCM agility are strong communication with its partners about the current situation, selection of the quick responder nearest suppliers, postponement of supplies, buffer stock, creation of third party logistics relationship and formation of emergency response team [Christopher, 2005]. Being agile in the provision of humanitarian services is a challenging task due to uncertainties, complexities, and the unknown demand for humanitarian services in a timely manner, yet it is almost an imperative in HO-LSCM, especially in operations of disaster response which usually arise suddenly and in great proportion [Cozzolino et al., 2012]. The capability for an agile response can be measured by identifying the agility matrix which is based on an agile framework [Charles et al., 2010]. Business organizations can also measure their supply chain agility on the bases of customer sensitization, processes integration, network integration and virtual integration [van Hoek, Harrison, Christopher, 2001, Merminod et al. 2014]. With the addition of stakeholders, together with the emerging concept of fourth party logistics related to customers, processes and integration of services, agility and the measurement of the agile outcomes in HO-LSCM can be developed.

Lean management in HO-LSCM

Leanness implies improvement in the overall supply chain management systems, focusing on efficiency and cost saving [Cozzolino, Rossi, Conforti 2012a]. Lean thinking started in the 1980s, based on Toyota Production System, but the first time the word "lean" was coined was in 1990 by John Krafcik into his master thesis, reported in [Ohno 1988]. Lean management refers to doing more with less resources, and mainly seeks to minimize on-hand inventory of components and work-in-progress, and to move towards a just-in-time replenishment environment [Ohno 1988]. Lean means the elimination of waste and doing more with the less resources. To overcome inventory outage, lean systems thinking recommends that inventory is produced in advance, but primarily for immediate on-hand requirements, and just-in-time availability, with production only weeks in advance at most, as distinct from the more traditional inventory management thinking of eradicating outages by holding inventory months and even years ahead of allocation to production [Rahimnia, Moghadasian 2010].

In HO-LSCM, 40% of budgets expenditure has been reported as wasted, due to factors such as duplication of ordering, duplication and redundancy of effort, lack of time to carry out effective analysis, and lack of coordination and sequencing of activities. [Bealt et al. 2016, Day, Melnyk, Larson, Davis, Whybark 2012, Van Wassenhove 2006]. HOs are funded and governed in different ways from different donors who are increasingly demanding proper control and accountability, transparency and value for money in return for their sponsorship [Tomasini, Van Wassenhove 2009, Antai et al. 2015]. This return-on-investment is possible through improved, efficient, operational performance, achievable by a professional management approach and supply chain efficiency, enabling continued effective use of resources [Scholten et al. 2010].

In operational performance, the interesting part is the transition and shift from agile (speed) to lean (cost reduction) strategy. During disasters, due to the urgency of immediate needs and high levels of uncertainty, all supply chain process must focus on speed, and cost must take a back seat. Once the immediate urgent operations have been achieved, and the continuing needs roles have been defined, meaning better visibility of the process necessary to assist beneficiaries, then efficient cost drivers can be adopted at this stage [Tomasini, Van Wassenhove 2009]. In all situations, the legitimacy of the need for efficient HO-LSCM system, recommends lean management through the integration of local, regional and central level management plans [Marcinkowski 2017].

Leagility management in HO-LSCM

The term "Leagility" was introduced in the supply chain design to avoid or minimize inflexibility and overage in the supply chain by making it lean and agile. Its origins are unstated, but numerous papers addressing supply chain management have adopted the term. Leagility is the ability of an organization to keep balance in agile and lean practices of supply chain management. Leagility is the combination of leanness and agility within a total supply chain strategy using a decoupling point. The decoupling point in supply chain management is the product axis where lean and agile strategy intersect each other for ensuring deliveries according to customer requirements [Rahimnia, Moghadasian 2010]. Implementation of agile does not exclude the lean principles; rather; both lean and agile can work with in the same supply chain management at different points and at the different moments [Aitken et al., 2002, Christopher 2005,Narasimhan, Swink, Kim 2006, Scholten et al. 2010]. A theoretical decoupling point model was developed on the bases of supply chain disaster management cycle (preparedness, emergency, response, restore, and reconstruction) which explained that Agile management should be decoupled at the restoring phase and lean management should be enabled in reconstruction phase of the disaster management cycle [Cozzolino et al. 2012]. When a disaster occurs, and the situation is uncertain, "leanness needs to be decoupled from part of the supply chain process and agility should be coupled to the whole process as a priority [Childerhouse, Towill 2000].

Lean strategy provides markets with predictable demand, low variety and long product life cycle, whereas agility acts best in a volatile environment with high variety and short product life cycle [Rahimnia, Moghadasian 2010, Cozzolino, Rossi, Conforti 2012b]. Lean management is recommended for HO-LSCM upstream processes e.g. planning, sourcing, storage the lean management, while the downstream processes e.g. transportation and distribution into desired community benefit from agile management techniques. The HOs supply chain needs to respond to a dual customer base; the donor customer and the ultimate beneficiary, community or area. For dealing with the donor customer, lean management is required, whereas dealing with the assistance beneficiary or community customer, applying agile management techniques is essential. This dichotomy is supported in [Rahimnia, Moghadasian 2010], who also emphasized that the HOs emergency projects community customer should be catered for according to the agility concept, while dealing with the donor customer, lean concepts are relevant. Thus, to become an agile and lean (demand driven) HOs need to apply leagility, with strong coordination and communication from community level through to the upstream supply chain management system [Oloruntoba, Gray 2006].

Based on our literature review, we found that the existing Leagility frameworks proposed for the disaster management cycle, and which are very relevant to HO disaster management planning and implementation, have not been studied for their applicability to the normal operations of HOs. Our view is that Leagility should be applied to the detailed activities of HO-LSCM, and Lean and Agility priorities should be optimized in procurement/sourcing and distribution into the beneficiary community. No information was found in the literature that examined, tested or proved the achievements in HO-LSCM by the application of this concept of Leagility, thus we suggest the need for a self-evaluation model to analyze situations before and after adoption of the strategy, and to evaluate the outcomes.

TYPES OF RESEARCH AND ADOPTED METHODOLOGIES

The literature revealed that most of the HO-LSCM research is qualitative in nature. This technique emphasizes the generation of theories and frameworks, and is particularly relevant where information is insufficient, or the study is new in the field. Of 73 studies that we reviewed, 68 were qualitative in nature, only two study had adopted a purely quantitative technique, technique of research, and three studies used both qualitative and quantitative research approaches (see Figure 4).

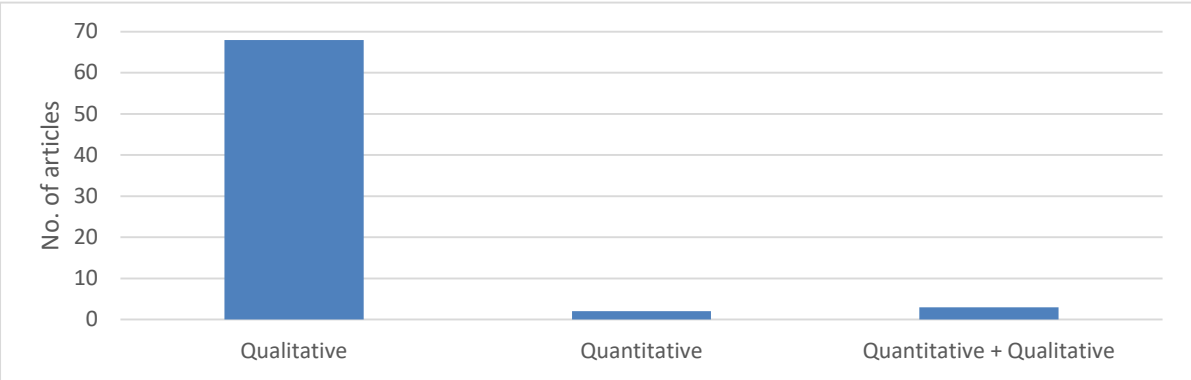

Fig. 4. Representation of qualitative and quantitative type of studies

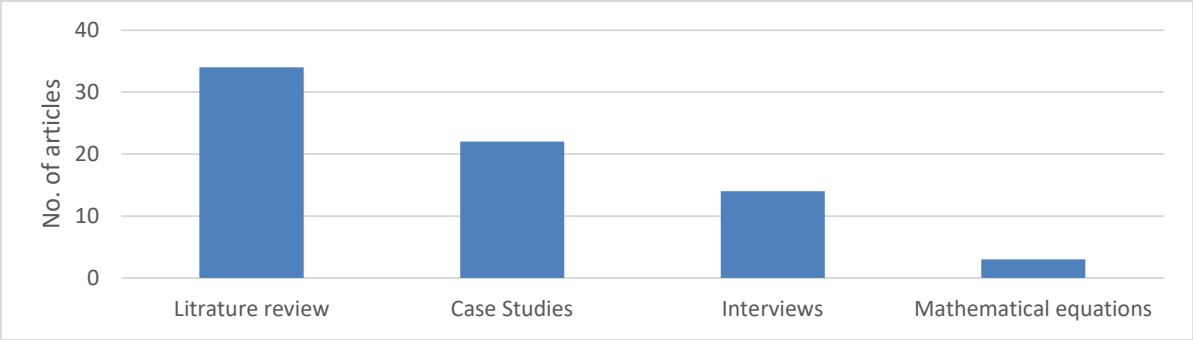

Fig. 5. Categorization of research methodologies, applied in reviewed literature

The 73 reviewed studies most often adopted a research methodology, or conceptualization techniques, based on a literature review (secondary data), case studies and interviews (Figure 5).

NOTABLE GAPS IN HO-LSCM RESEARCH

The terms "logistics" and "supply chain management" in the HO sector are overlapping, as we noted in our literature review. HOs have no standardized role for logistics and supply chain professionals and their jobs responsibilities are varied from organization to organization. The notable gap is; researchers need to present a standardized framework which may regularize the responsibilities of HO-LSCM professionals overall, for any organization, and job descriptions should be standardized, to overcome the often-confused view of what constitutes a "logistics professional" and a "supply chain management professional".

Another matter of significance that is not well addressed in the literature is the fact that the normal HO-LSCM operations are ignored; the challenges and issues of disaster response and aid management are well reported. Our view is that the efficiency of operations, particularly the normal operations, is an important matter requiring well-based studies.

A further matter is that most HO-LSCM studies have presented various frameworks for Agility management, and Efficient management, which we have discussed before, but only some of them have been well tested and few adopted. There are, clearly, no quality assessment and assurance frameworks that have been assessed for their adherence to standardized frameworks within ISO or the humanitarian sphere. Most studies have presented HO-Business partnership frameworks, but none presented a standardized model which may be applicable to every HO in pursuance of effectiveness and efficiency. While HO-Business partnership models have been presented as successful case studies, none have described unsuccessful HO-Business models case studies, by which professionals can learn, and avoid.

Relevant frameworks for HO-LSCM operations (procurement, inventory, fleet) presented various measures to promote effectiveness but there is a lack of research on operational efficiency. Fleet management of HOs, under normal conditions, lack research on optimizing resources, and no studies appear to be available that may guide organizations on developing good relationship management and efficiency, such as that which can be achieved through short term engagement of suppliers. HOs objectives are the same but HO-LSCM policies and implementation procedures vary significantly. Standardization of policies and procedures is a notable gap in the research and proactive measures are needed to bring about efficiency in HO-LSCM.

Leagility management is an important tool for bringing both effectiveness and efficiency in HO-LSCM, and the boundaries between Agility Management and Lean Management need to be redefined in detail for both disaster and normal HO-LSCM operations alike. Furthermore, Lean Management is an ignored

area in HOs and very few studies on organizational efficiency are to be found, indicating a need to more extensively explore Lean management in HO-LSCM.

CONCLUSIONS

In this paper, we have presented a review of existing studies in HO-LSCM to explore two broad and six specific questions. The primary purpose of this study was to analyze the available research that focuses on HO operational efficiency and effectiveness. In the terminology of LSCM, effectiveness is achieved and measured through agility, while efficiency is achieved and measured through leanness. Our review of the literature showed that HO-LSCM effectiveness (agility) has gained considerably more attention than efficiency (lean) management, which is a much-neglected topic. As HOs normally engaged in two major scenarios, namely disasters (usually sudden, serious, and widespread, demanding quick and immediate action), and the normal HO-LSCM scenario (when careful planning and consideration of circumstances can occur), our view is that both scenarios demand research attention, which has not been the case for normal operations, in past research. One final comment to be made is that more quantitative research is required, to provide more empirical, well-constructed and well tested case studies, to better support the recommendations regarding the adoption of organizational effectiveness as an informing concept. Qualitative studies, primarily based on personal observations, opinions and feelings, modified by the emotional impact of participating in disasters, are insufficient.

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LOGISTYKA I ZARZĄDZANIE ŁAŃCUCHEM DOSTAW AKCJI HUMANITARNYCH

STRESZCZENIE. **Wstęp:** Wspólnym celem różnych organizacji humanitarnych (HO) jest dostawa dóbr i usług potrzebującym bez jakiejkolwiek dyskryminacji. Podstawowe obszary działalności organizacji humanitarnych to obszary związane z klęskami żywiołowymi, ochron praw człowieka, ułatwianie życia oraz upowszechnianie wiedzy i chęci działania w celu podniesienie bezpieczeństwa, szacunku i poważania zarówno jednostki jak i całego społeczeństwa bez osiągania przy tym zysków. Logistyka i łańcuch dostaw organizacji humanitarnych jest powszechnie uważany za najbardziej kosztochłonną cześć całej działalności humanitarnej i wymaga zrównoważonych rozwiązań. Organizacje humanitarne musza korzystać ze swoich funduszy skutecznie i wydajnie. Prezentowana praca ma na celu przegląd poprzednio wykonywanych badań i zidentyfikowanie obszarów wymagających dalszej poprawy w obszarze logistyki i zarządzania łańcuchem dostaw organizacji humanitarnych (HO-LSCM).
Metody: Koncentrując się na wydajności i skuteczności, w trakcie badań zidentyfikowano i skatalogowano badania dotyczące tematyki HO-LSCM, dzieląc je na pięć grup: koncepcja HO-LSCM, wyzwania i główne zadania HO-LSCM, zarządzanie organizacją, zarządzanie wydajności i skutecznością HO oraz typy badań i metodologii tych badań. W oparciu o te dane zidentyfikowano rozbieżności w dostępnych opracowaniach badań i zidentyfikowano zalecenia dla przyszłych badań.

Wyniki: Istniejące badania skupiają się na skuteczności, uwzględniając sprawność organizacyjną, podczas gdy stosunkowo mało uwagi poświęca się wydajności. 94% badań dotyczących HO-LSCM bazuje na badaniach jakościowych i większość z nich jest podstawą do tworzenie teoretycznych ram, które nie są testowane ani szerzej stosowane. W obszarze zarządzania logistyką i łańcuchem dostaw, każda organizacja humanitarna ma swoją politykę działania i procedury postępowania. Obszar ten wymaga standaryzacji w celu umożliwienie oszacowania i ocenienia wydajności i skuteczności logistyki i łańcucha dostaw tych organizacji.
Wnioski: Przeprowadzone badanie jakościowe skuteczności i wydajności, jest pierwszym jakie zostało wykonane w obszarze HO-LSCM w przeciwieństwie do wcześniej badań, skupiających się jedynie na skuteczności zarządzania. W pracy podkreślono konieczność rozszerzenie analizy badań dotyczących zarządzania w organizacjach humanitarnych.

Słowa kluczowe: Organizacje humanitarne (HO), logistyka i zarządzanie łańcuchem dostaw organizacji humanitarnych (HO-LSCM), skuteczność i wydajność, zwinność i zarządzanie typu Lean (A & LM).

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