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EFFICIENCY AND EFFECTIVENESS OF HUMANITARIAN ORGANIZATIONS'LOGISTICS AND SUPPLY CHAIN MANAGEMENT: A SYSTEMATIC REVIEW

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ABSTRACT:

The processes of a Humanitarian Organizations Logistics and Supply Chain Management (HOLSCM) are the most expensive part of Humanitarian Organizations (HOs) operations, and such organisations must ensure effective and efficient utilisation of funds applied to HOLSCM. In this study, we reviewed the literature relevant to HOLSCM to enable us to develop an appropriate Efficiency and Effectiveness Management Framework (EEMF) to enhance these aspects of HOs activities, by identifying the gaps in the research where efficiency and effectiveness have been overlooked or insufficiently emphasised. The research is based on the systematic review methodology commonly used in the medical and healthcare fields. The focus is the identification of HOs effective and efficient operations and their analyses in a descriptive and thematic way. Results showed that existing studies focus either

on Effectiveness, being the application of organizational agility to management, or Efficiency, as Lean Management, which is an undeveloped area of study.

1. Introduction:

The pivotal function of HOs is to deal with disasters and to promote and develop the socially and economically deprived (underdeveloped) community (Doyle, Gorman, & Mihalkanin, 2016). (Doyle et al., 2016) project that the HOs scope and goals encompasses human rights protection and relief services provision as per need. Additionally, awareness and building of individual and community level resilience as well as preparedness for multiple calamities and societal disruption. For achieving these goals and responsibilities, any HO will rely on their supply chain and logistics capability (HOLSCM), due to which, nearly eighty percent of the total budget spending is connected to LSCM (Kent, 2004). The HOLSCM procedures are composed of procurement processes for possession, storage and safe keeping of the required items, resources, merchandise, and the best possible, proficient, compelling and opportune stock as per the demand of the mission (Cozzolino, A. 2012).

The manufacturing isn't typically engaged with HOs activities and unexpected upspring of a crisis or catastrophe is an attribute of the HO supply chain and logistics issues observed by HOs, which are not looked by regular business associations. The HOs supply chain and logistics management (HOLSCM) activity cost is known to be around 25% higher than similar business LSCM ventures (Whiting & Ayala-Öström, 2009). The explanations behind this are mind boggling and can include such factors as intrinsic vulnerability, constrained utilization of indigenous technology, human asset troubles, and underprivileged structural foundation (Antai, Mutshinda, &Owusu, 2015). In this manner, proficient LSCM operationalisation is essential to the productive accomplishment of HOs purpose.

Nowadays HOs are going under expanding pressure from humanitarian agencies of United Nations, revenue driven associations and government offices to convey philanthropic administrations using sporadic funding reservoirs (Oloruntoba&Gray, 2009; Scholten, Sharkey Scott, &Fynes, 2010). Funding conduct of donors is moving from "project based" toward "performance based" dispensing of resources, in which just with the forwarding and positive assessment of mission accomplishment reports will funders discharge resources to HOs, and just for exercises regarded accomplished. This culture of "performance based" funding has created an environment where the significance of HO's 'efficiency' is rapidly finding the customary accentuation on 'effectiveness'.

Efficiency in management processes is defined as the capability for mitigation of wastage, avoidance of idleness along with reduction in task duplicate, energy conservation, make the most of input through rigorous cost and time investment reduction for overall operations (Provan &Kenis, 2008), as such, "doing the things right" (Zidane & Olsson, 2017). Generally, the efficiency can be achieved through Lean Management, a concept and practice that was successfully applied in the Toyota Motor Company, enabling it to become the world's leading and most profitable car manufacturing enterprise. Effectiveness in organisational activities is defined as "doing the right thing" (Zidane & Olsson, 2017), and at the "right time"- such as on account of crisis relief operations focusing on the rapid delivery of goods and services (Sundqvist, Backlund, & Chronéer, 2014). Effectiveness has been widely discussed and practiced under the heading of organisational agility, a concept defined by McKinsey and Co as "Agility is the ability of an organization to renew itself, adapt, change quickly, and succeed in a rapidly changing, ambiguous, turbulent environment", which has been adapted in a variety of industries, including agile shipbuilding, agile software development, and more lately in the education field under the heading of agile education.

In this study, the existing HOLSCM research publications were reviewed, focusing on both HO operational efficiency and effectiveness. The primary purpose was to develop a comprehensive HOLSCM-Efficiency and Effectiveness Management Framework (HOLSCM-EEMF), and to depict the observable lapses in the available reservoir of research that upcoming research work should endeavour upon. Using the keywords, given in the Methodology Section below, 89 peer-reviewed articles were identified and analysed.

Descriptive analysis was undertaken to identify the types of studies previously published, and identify the methodology adopted and the focus of the studies. Thematic analysis of the selected papers provided the definitions of efficiency and effectiveness, as given in our introduction, and the term efficacy, as applied to the study area (HOLSCM). This allowed us to understand and apply the term leagility in terms of the relationship between the concepts inherent in Lean Management, and in Organisational Agility: thus Leagility. The important question of performance management and its role in HOLSCM Efficiency and Effectiveness was also considered, leading to our development of the Framework of Efficiency and Effectiveness, which informed the identification of, and further discussion on, the gaps in the research into the efficiency and effectiveness of HOLSCM operations.

The definition canvas, which connects the descriptive conceptualisation of HOLSCM with the systematic review way forward, is encapsulated by the understanding of HOLSCM being the complete cycle of effectively planning, implementing, and controlling of the logistics and supply value chain of services through cost leadership to meet the targets (Hong, Jeong, & Feng, 2015). Moreover, HOLSCM is the geo-strategic warehousing for projected inventory management, based on need analysis, in terms of simple to complex set of solutions composed of material, equipment and goods (Vojvodic, Dujak, & Plazibat, 2015). HOLSCM is the spine of the operations with respect to access to supply chain and logistics support that is vital for HOs response to disaster or development situations (Chong, Lazo Lazo, Pereda, & Machuca De Pina, 2019). Collectively, HOLSCM is the distinguished and vital unit of an HO, which can be the major reason of success or failure of missions (Cozzolino, 2012).

2. Methodology:

A systematic research method, traditionally used in medical and health care research and which subsequently used in the engineering and management sciences (Lettieri, Masella, & Radaelli, 2009), was adopted. The systematic review method is a pragmatic, transparent and evidence-based approach for conducting literature reviews and analysing existing studies (Lettieri et al., 2009). Such an approach protects the fidelity, completeness and rigor of the literature review, showing how the review was carried out, what types of data were analysed (e.g. articles, books), from where that data was gathered, and what criteria that were used to extract and include that data in the final consideration. The steps of a systematic literature review are:

I. Planning the research
II. Finding relevant data (papers, books, etc.)
III. Screening the data
IV. Extracting, synthesizing and analysing the data and reporting the descriptive and thematic results

2.1 Planning the research:

The literature review was undertaken with the assistance and expertise of four experts (three from Pakistan and one from Thailand) who were HOLSCM practitioners, and who agreed to participate as a review panel of this study. These panel members participated in online

meetings to discuss the research title 'Efficiency and Effectiveness in HOLSCM' as clearly indicating the focus of the research. Possible research key focus areas were discussed and developed with and by the review panel and the following map was drawn up to guide the further investigations:

i. The nature of HOLSCM and its different types of fundamental operations.
ii. Concept of efficiency, effectiveness and efficacy, especially applicable to HOLSCM.
iii. Concept of lean, agile and leagility in terms of efficiency and effectiveness.
iv. Performance management practices and processes in terms of efficiency and effectiveness.
v. Development of the new HOLSCM-Efficiency and Effectiveness Management Framework (EEMF).
vi. Based on HOLSCM-EEMF, a subsequent review and discussion arising in regard to HOLSCM operations e.g. procurement, inventory and transportationmanagement operations.
vii. Identification of the notable gaps identified in the HOLSCM research.
viii. Conclusion of the study.

This map played an essential role in the identification of relevant studies and the elimination of those which were irrelevant to the current scope. A review protocol, described and discussed below, was developed indicating how the literature review should be conducted, what databases would be searched, what type of studies would be included or excluded and the criteria to assess the quality of studies gathered.

2.2 Finding relevant data:

To identify and evaluate relevant literature a list of key words was developed using the research map. Those key words are: "humanitarian supply chain management efficiency", "humanitarian supply chain management effectiveness", "humanitarian logistics efficiency", humanitarian logistics effectiveness", "Humanitarian logistics and supply chain efficacy", "humanitarian supply chain lean management", "humanitarian supply chain agility management", "humanitarian logistics and lean management", "humanitarian logistics and agility management", "humanitarian supply chain leagility", "humanitarian logistics leagility", "humanitarian operations management", "emergency operations efficiency and effectiveness" and "disaster management efficiency and effectiveness". As well, articles that were reviewed cited other articles, which were also located and evaluated for inclusion. The databases that were searched included SCOPUS, EMERALD, SCIENCE DIRECT, WEB OF SCIENCE (ISI) and GOOGLE SCHOLAR. Finally, only full, published, peer reviewed articles were selected, and books were excluded from this review process.

2.3 Screening the data:

Selected publications were downloaded from the databases and also directly from journal websites. To qualify for inclusion, each study had to meet the Inclusion and Exclusion Criteria (Table 1), which were developed during the discussions with the review panel, following the analogy in (Sánchez González, García Rubio, Ruiz González, & Piattini Velthuis, 2010)). The information recorded for each selected study included:

1. Reference of study (name of journal, authors, publishers, year etc.).
2. Methodology (Empirical and Analytical).
3. The perspectives, areas identified during the mapping field exercise.

Table 1: Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Research relevant to HOLSCM efficiency, effectiveness, Agility and Lean management with developed theories and frameworks	Studies relevant to government departments
Studies falling within the scope of the described map of studies	Studies falling outside the scope of the described map of studies
Only peer reviewed articles are included / No books	Research which did not pass quality assessment, i.e. research that was not peer reviewed or not published
Both academic and practitioner research	Papers published before 1995

We identified 1803 papers relevant to our subject, and papers were deleted that were apparently duplicated papers; identified by duplicate titles, and duplicate authors, or were not peer-reviewed, or where the abstract did not mention topics about humanitarian organisations e.g. non-government organisations and United Nations (UN) humanitarian agencies. We did, however, include studies which defined and explained efficiency and effectiveness were included, even if the study did not specifically address the topic of HOs. Studies relevant to government departments were also excluded. The final selection included 89 articles which we then studied the full text to collect the data for our descriptive and thematic analysis.

2.4 Extracting, synthesizing and analysing the data to report research and its gaps:

The 89 articles selected were categorized and synthesized, first by descriptive analysis and then by thematic analysis. The descriptive analysis output included the main details of the selected studies, including year of publication, authorship, study key focus areas, and research methodology. Based on study of Woackers(1998), research methodologies are classified into two categories; empirical and analytical. The empirical methodology includes the use of statistical sampling, interviews or case studies, while, analytical methodology includes the conceptual methods and mathematical analysis techniques.

In the thematic analysis, the concepts, implications, and contributions to the HOLSCM, of the five key focus areas, elaborated in Section 2.1, were analysed, and the research gaps identified were highlighted.

The correlations among four of the key focus areas (i.e. The nature and types of HOLSCM operations, the concepts of efficiency, effectiveness and efficacy, the concepts of lean, agile and 'leagility', and performance management practices and processes), indicating the emergence of these concepts in the HOLSCM-Efficiency and Effectiveness Management Framework, are discussed in Section 4.5.As well, based on the HOLSCM-EEMF, the fifth key focus area of the research "HOLSCM operations", i.e. inventory, transportation and procurement management operations, are reviewed contextually connected to effectiveness andefficiency as well as potential research gaps were identified. Section 5 then discusses the amalgamation of all the notable gaps identified in the published research on the five key focus areas.

3. Descriptive Analysis:

The details and critical analysis of the reviewed papers are described inFigures 1 to 3 and Table 2.

3.1 Research Methodology (Data collection and applied analysis techniques)

The selected studies were divided mainly into empirical studies and analytical studies. Analysis of the articles indicated that analytical studies were more frequent, with 55 empirical studies and 33 analytical studies identified. These were further divided into four categories in terms of data collection and analysis techniques. These are illustrated in Table 2. Thorough analysis showed that the papers classified as empirical papers, with data collected through questionnaire survey and applied statistical analysis, remains an under-developed area of research, providing the potential for further research to explore HOLSCM, applying statistical techniques. The details of each part are shown in Figure 1.

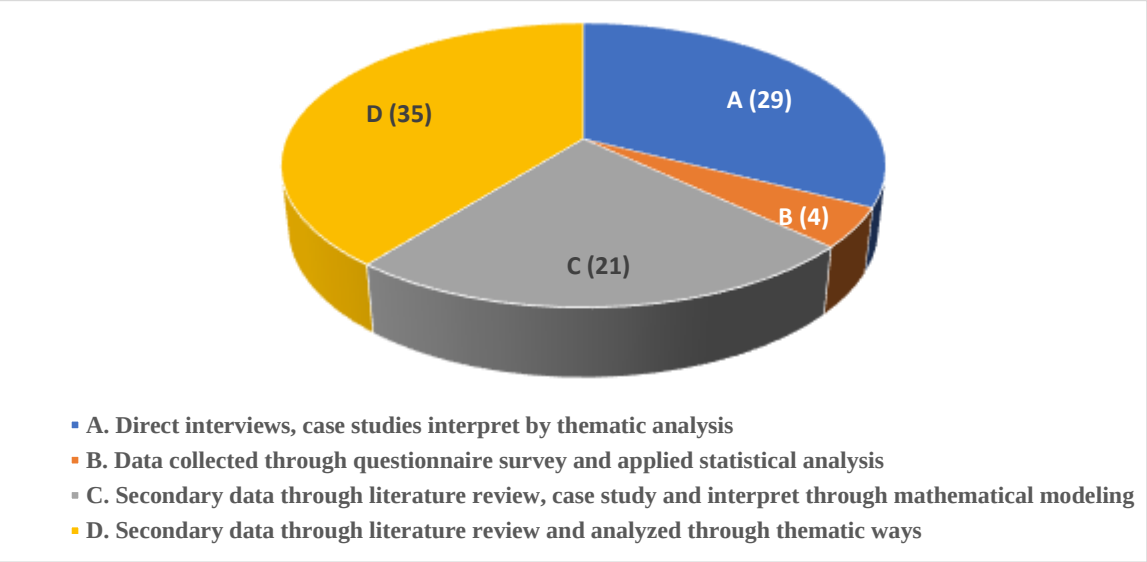


Figure 1. Data collection and applied analysis techniques

3.2 Categories of concepts identified:

According the Review Map (see Section 3.1: Planning the Research), the selected papers were divided into four major concept areas:

- Efficiency, effectiveness and efficacy in HOLSCM,
- Lean, agile and 'leagility' in terms of efficiency and effectiveness,
- Performance management in terms of efficiency and effectiveness,
- Other studies relevant to HOLSCM efficiency and effectiveness

Studies directly focused on performance management, efficiency and effectiveness concepts remained lower, the breakdown of the selected studies is illustrated in Figure 2.

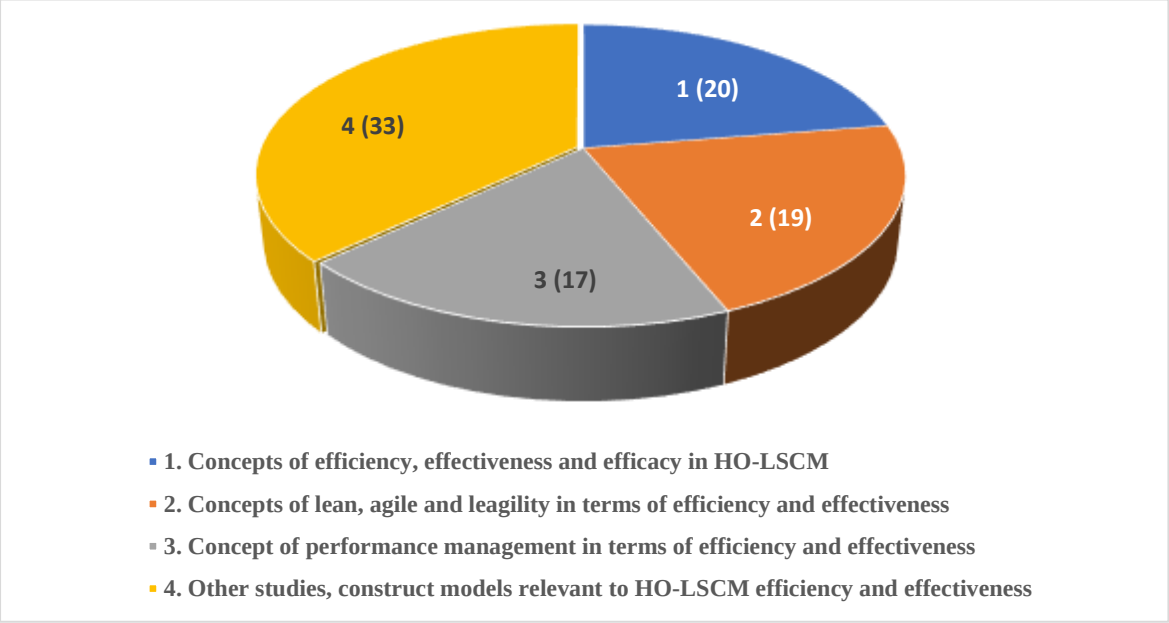


Figure 2. Division of articles according to categories of reviewed concepts

3.3 Other descriptive analysis (Years, and publishing journals)

HOLSCM seems to have become of research interest in 2006. Since then, there has been a growth in publications; for our study we found 14 articles published up to June 2018. (See Figure 3).

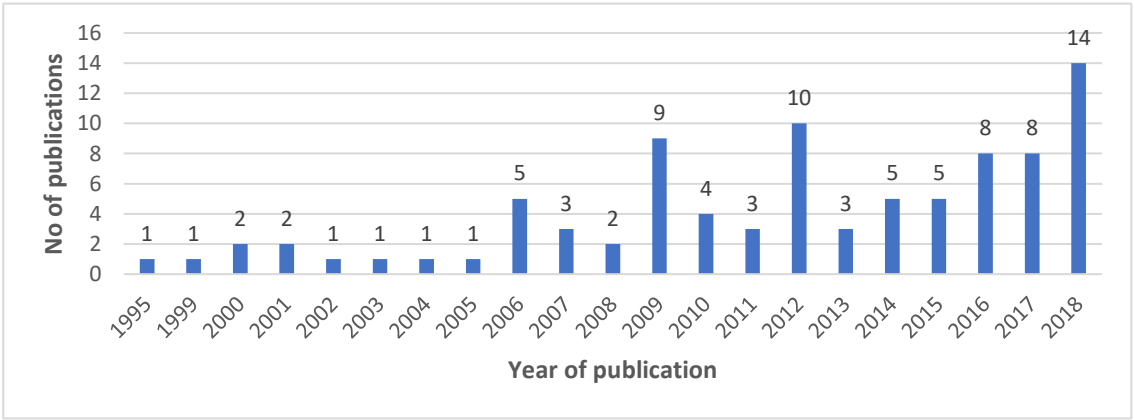


Figure 3. Reviewed articles years of publications

Table 2: Descriptive Analysis of Systematic Reviewed Papers

Title of article	Type of study		Methodology				Year	Names of Journals	Category				Country
	Qualitative	Quantitative	Direct interviews &	Survey	Mathematical	Review			Concepts of efficiency, effectiveness and efficacy in	Concepts of lean, agile and leagility in terms of	Concept of performance management in terms of	Construct models (frameworks) in terms of	Authors' affiliation Country
Not-for-profit supply chains in interrupted environments: the case of a faith-based humanitarian relief organisation	x		x				2009	Management Research News				x	Canada
Gaps between research and practice in humanitarian logistics	x		x				2016	The Journal of Applied Business and Economics			x		USA
Cracking the humanitarian logistic coordination challenge: lessons from the urban search and rescue community	x		x				2016	Sādhanā			x		Finland
Customer service in emergency relief chains	x					x	2009	Disasters				x	UK
Humanitarian relief	x		x		x		2017	Sādhanā				x	India

supply chain: a multi-objective model and solution													
Logistics service network design for humanitarian response in East Africa	x		x		x		2018	Omega				x	Canada
Streamlining humanitarian and peacekeeping supply chains	x					x	2014	Society and Business Review		x		x	Canada
Supply chain process modelling for humanitarian organizations	x		x			x	2010	International Journal of Physical Distribution & Logistics Management		x		x	Germany
Building humanitarian supply chain relationships: lessons from leading practitioners	x		x				2011	Journal of Humanitarian Logistics and Supply Chain Management				x	Canada
Humanitarian–business partnerships in managing humanitarian logistics.	x					x	2017	An International Journal				x	Indonesia
Collaborative relationships between logistics	x	x		x		x	2016	Journal of Humanitarian Logistics and				x	UK

service providers and humanitarian organizations during disaster relief operations								Supply Chain Management					
Japanese And American Approach To Humanitarian Logistics In Natural Disasters' prevention	x		x			x	2017	LogForum				x	Poland
Performance measurement in humanitarian logistics: a customer-oriented approach.	x					x	2014	Journal of Humanitarian Logistics and Supply Chain Management			x		UK
A 3-R principle for characterizing failure in relief supply chains' response to natural disasters	x		x			x	2015	Journal of Humanitarian Logistics and Supply Chain Management			x		Sweden
Valuing organizational values: Assessing the uniqueness of non-profit values		x	x				2015	international journal of voluntary and non-profit organizations			x	x	Germany
A model to define and assess the agility of supply chains: building on humanitarian	x					x	2010	International Journal of voluntary and non-profit organizations	x	x		x	France

experience													
From preparedness to partnerships: case study research on humanitarian logistics.	x					x	2009	NTERNATIONAL TRANSACTIONSIN OPERATIONALRESEARCH			x		France
Humanitarian Logistics and Supply Chain Management	x					x	2012	Humanitarian Logistics, Springer			x		Italy
Agile and lean principles in the humanitarian supply chain	x					x	2012	Journal of Humanitarian Logistics and Supply Chain Management	x	x	x		UK
Humanitarian aid: an agile supply chain?	x					x	2006	Supply Chain Management: an international journal	x	x			Australia
(Le)agility in humanitarian aid (Uy, Chan, Sam, Ho, & Chernyshenko) supply chains	x					x	2010	Journal of Physical Distribution & Logistics Management	x	x			Ireland
International humanitarian crises	x					x	2004	International Affairs					USA
Local wisdom-based disaster recovery model in Indonesia	x		x			x	2012	An International Journal				x	Australia

Learning mechanisms for humanitarian logistics	x		x			x	2013	Journal of Humanitarian Logistics and Supply Chain Management				x	Singapore
Developing supply chains in disaster relief operations through cross-sector socially oriented collaborations: a theoretical model	x		x			x	2009	Supply chain management: an international journal				x	Belgium
Critical success factors in the context of humanitarian aid supply chains	x					x	2009	International Journal of Physical Distribution & Logistics			x		UK
Legitimation work within a cross-sector social partnership	x					x	2015	Journal of Business Ethics				x	Germany
Disaster relief, inc	x					x	2006	Harvard business review					UK
Humanitarian aid logistics: supply chain management in high gear	x					x	2006	Journal of the Operational research Society		x			France
Advocacy to promote logistics in humanitarian aid	x		x			x	2009	Management Research News			x	x	UK
Disaster management:	x					x	2009	Disaster Prevention				x	Italy

findings from a systematic review								and Management: An International Journal					
Performance measurement system design: A literature review and research agenda	x					x	2005	International journal of operations & production management			x		UK
Performance measures and metrics in logistics and supply chain management: a review of recent literature (1995–2004) for research and applications	x					x	2007	International journal of production research			x		UK
Humanitarian supply chain performance management: a systematic literature review	x					x	2014	Supply Chain Management: An International Journal			x		Germany
Project monitoring and evaluation: a method for enhancing the efficiency and effectiveness of aid project implementation	x					x	2003	International journal of project management	x	x			Austrelia

Coordination quality index: a metric for measuring the quality of coordination efforts in humanitarian supply chain	x				x		2018	International Journal of Intelligent Enterprise			x		India
Disaster relief supply pre-positioning optimization: A risk analysis via shortage mitigation	x				x	x	2017	International Journal of Disaster Risk Reduction				x	Brazil
Inventory management of perishable items in long-term humanitarian operations using Markov Decision Processes.	x				x		2018	International Journal of Disaster Risk Reduction				x	Brazil
An approximation approach to a trade-off among efficiency, efficacy, and balance for relief pre-positioning in disaster management	x				x		2016	Transportation Research Part E: Logistics and Transportation Review	x			x	Iran
Pre-positioning of relief items in humanitarian logistics considering	x				x		2017	Socio-Economic Planning Sciences				x	Turkey

lateral transhipment opportunities													
Cooperative maximal covering models for humanitarian relief chain management	x				x		2018	Computers & Industrial Engineering				x	USA
An effective two-stage stochastic multi-trip location-transportation model with social concerns in relief supply chains		x			x		2018	European Journal of Operational Research				x	Brazil
A novel multi-objective programming model of relief distribution for sustainable disaster supply chain in large-scale natural disasters	x				x		2018	Journal of Cleaner Production				x	China
Disaster preparedness for better response: Logistics perspectives.	x				x		2018	International Journal of Disaster Risk Reduction		x		x	Japan
Redesign strategies of a comprehensive robust relief network for disaster management	x				x		2018	Socio-Economic Planning Sciences				x	Iran

Digital Supply Chain: Literature review and a proposed framework for future research	x					x	2018	Computers in Industry				x	Turkey
Designing an efficient humanitarian supply network	x				x		2016	Journal of Operations Management	x	x			France
Modeling the values of private sector agents in multi-echelon humanitarian supply chains	x				x		2018	European Journal of Operational Research				x	USA
Defining project efficiency, effectiveness and efficacy.	x					x	2017	International Journal of Managing Projects in Business	x				Norway
What is project efficiency and effectiveness?	x					x	2014	Procedia-Social and Behavioral Sciences	x				Sweden
Leadership is vital for project managers to achieve project efficacy	x					x	2013	Research Journal of Recent Sciences	x				Pakistan
Critical success factors for international development	X					x	2016	International Journal of Managing Projects in	X				Italy

projects in Maldives: Project teams' perspective								Business					
Improving bid pricing for humanitarian logistics.	x		x				2009	International Journal of Physical Distribution & Logistics Management				x	USA
From preparedness to partnerships: case study research on humanitarian logistics	x		x				2009	International Transactions in Operational Research				x	
Supply chain leagility in professional services: how to apply decoupling point concept in healthcare delivery system	x		x				2010	Supply Chain Management: An International Journal		x			Iran
Toward a sustainable and wise healthcare approach: potential contributions from hospital Internal Medicine Departments to reducing inappropriate medical spending.	x		x				2013	Italian Journal of Medicine	x				Italy

Field vehicle fleet management in humanitarian operations	x		x				2011	Journal of operations management				x	France
A two-stage procurement model for humanitarian relief supply chains	x		x				2011	Journal of Humanitarian Logistics and Supply Chain Management				x	USA
Fleet management policies for humanitarian organizations: Beyond the utilization–residual value trade-off.	x		x				2016	Journal of operations management				x	USA
Humanitarian and disaster relief supply chains: a matter of life and death	x		x				2012	Journal of Supply Chain Management		x		x	USA
Transportation in disaster response operations	x				x		2012	Socio-Economic Planning Sciences					Canada
Performance measurement in humanitarian relief chains	x		x				2008	International Journal of Public Sector Management			x		USA
Understanding, implementing and exploiting agility and leanness.	x					x	2002	International Journal of Logistics		x			UK

Lean vs agile from an organizational sustainability, complexity and learning perspective.	x			x			2012	The Learning Organization		x			portugal
Thomas Davies, NGOs: A New History of Transnational Civil Society.	x					x	2015	Voluntas: international journal of voluntary and nonprofit organizations,		x			UK
Engineering supply chains to match customer requirements.	x					x	2000	Logistics information management		x			UK
An integrated model for the design of agile supply chains.	x					x	2001	International Journal of Physical Distribution & Logistics Management		x	x		UK
Supply chain migration from lean and functional to agile and customised.	x					x	2000	Supply Chain Management: An International Journal		x	x		UK
Understanding the role of logistics capabilities in achieving supply chain agility: a systematic literature	x					x	2012	Supply Chain Management: An International Journal				x	USA

review													
Models for relief routing: Equity, efficiency and efficacy. Transportation Research Part E:		x			x		2012	Logistics and Transportation Review	x				USA
Project success as a topic in project management journals.	x					x	2009	Project Management Journal			x		Canada
A balanced approach to building agile supply chains.	x					x	2006	International Journal of Physical Distribution & Logistics Management				x	UK
Disentangling leanness and agility: an empirical investigation.		x		x			2006	Journal of operations management		x			USA
Leagility: Integrating the lean and agile manufacturing paradigms in the total supply chain	x					x	1999	International Journal of production economics	x				UK
Conflicts related to effectiveness and efficiency in Norwegian rail and hospital projects	x					x	2007	SINTEF Technology and Society.			x		Norway

Modes of network governance: Structure, management, and effectiveness.	x					x	2008	Journal of public administration research and theory		x			USA
Literature review on the agile manufacturing criteria	x					x	2007	Journal of Manufacturing Technology Management		x			India
To learn or not to learn from project monitoring feedback: In search of explanations for the contractor's dichromatic responses.		x		x			2014	International journal of project management		x			Australia
A measurement of the effectiveness and efficiency of pre-disaster debris management plans.		x		x			2017	Waste Management			x		USA
Humanitarian supply chain management: a thematic literature review and future directions of research.	x					x	2018	Annals of Operations Research	x				India
Emergency Supply Chain Management Based on Rough Set – House of Quality		x			x		2018	International Journal of Automation and				x	China

								Computing					
Investigation of efficiency and effectiveness of the existing disaster management frameworks in Sri Lanka.	x					x	2018	Procedia engineering		x			Sri Lanka
A framework for improving operational effectiveness and cost efficiency in emergency planning and response	x					x	1995	Disaster Prevention and Management: An International Journal			x		USA
Measuring agile capabilities in the supply chain.	x					x	2001	International Journal of Operations & Production Management				x	UK
Three dimensional printing–a key tool for the humanitarian logistician?	x					x	2015	Journal of Humanitarian Logistics and Supply Chain Management	x				Australia
Rollout algorithms for resource allocation in humanitarian logistics.		x			x		2018	IISE Transactions				x	China

Disaster relief inventory management: Horizontal cooperation between humanitarian organizations.		x		x			2017	Production and Operations Management	x				Canada
Supply chain agility in humanitarian protracted operations.	x					x	2016	Journal of Humanitarian Logistics and Supply Chain Management	x				Australia
Disaster relief routing: Integrating research and practice.	x					x	2012	Socio-Economic Planning Sciences	x				USA
Frequency	**79**	**10**	**23**	**6**	**18**	**50**			**19**	**23**	**21**	**40**	

4. ThematicAnalysis:

Reviewing the five identified key focus areas (elaborated in Section 2.1), thematic analysis was undertaken. The important concepts identified, and the results of that analysis,are reported in detail under sections 4.1,4.2,4.3,4.4,4.5 and 4.6. As previously discussed in Section 2.4, the analysis of the first four key focus areas (4.1, 4.2, 4.3, 4.4) are showed the relationships between each, allowing the combining of the concepts to be presented as our HumanitarianOrganizations Supply Chain and Logistics Management Effectiveness and Efficiency Management Framework (HOLSCM-EEMF) (Figure 4).

Based on this framework, thekey focus area "HOLSCM operations"is reviewed related toefficiency and effectiveness in the logistics and supply chain management processes, andthe notable gaps in research into inventory, transportation, and procurement management operations highlighted. Furtherdetaileddiscussion about each focus area and HOLSCM-EEMF is given below.

4.1 The Nature of HOLSCM and its Different Types of Fundamental Operations:

The operations and procedures of HOLSCM are nearlymatchingto the ones practiced and followed in the corporate arena of LSCM, with the notable exclusion of manufacturing, which does not come under the scope HOprocesses. As defined in the Introduction, manufacturing is not included in our definition of HO operations. As according to common usage, the terms "Humanitarian Logistics" and "Humanitarian Supply Chain Management" are used interchangeably, and no significantly different definition was found for each term in the reviewed literature.Usually,HOLSCMis engaged with two distinct operational categories; long-term support and development projects, with sustainable development goals for rehabilitation of disaster prone communities, economic development, education, health, energy, and equality, in which logistics and supply chain operations are usual and systemised. The second type of operations involve emergency response activities, requiring entirely different actions. For emergency operations, disaster management includes preparing for, and planning responses to, disasters that suddenly and usually without warning, severely impact communities(Behl & Dutta, 2018; Oloruntoba & Gray, 2006; Van Wassenhove, 2006).

For the long-term humanitarian support and development operations, delivering goods and services isproperly managed, an orderly, plan-able activity that is on-going and predictable. Emergency operations are short term, unpredictable and severe, requiring critical and immediate response (Christopher & Tatham, 2014; McLachlin, Larson, & Khan, 2009; Oloruntoba & Gray, 2006).One of the notable yardsticks for measuring performance of disaster operations and relief management is the proportion of time 'effectiveness'(for example rapid response to the addressees), in contrast the scenario for developmental procedures tasks is rather a proportion of 'efficiency'(for example cost mitigation and manageable asset utilization)(Lettieri et al., 2009).Existing studies on HOLSCM are primarily focused on disaster responses and emergency operations, and long-term developmental operations are still an underdeveloped area that requires researcher attention.

4.2 Concepts of efficiency, effectiveness and efficacy and available studies in HOLSCM:

4.2.1 HOLSC Mefficiencymanagement:

Thetermefficiencymanagementrefers"todoingthingsright", in that whateverisbeing performedorbeingproducedhasbeen done in anappropriateand correct wayandutilizesavailableresourcesefficiently (Sundqvist et al., 2014).Efficiencycan be measuredintermsoftime,cost,and quality of the performance of the service or activity,andby

the satisfaction level of bene ficiaries (Zidane&Olsson,2017).Olsson(2007)defined efficiency as the production of direct outputs as the result of inputs, similarly to Ika(2009) who defined efficiency is maximization of output at optimum expansion of inputs.Although we can conclude that the concept of "efficiency" isrelated to acting inamannertominimizethelossorwasteofenergyinthe overallproductionsystemorsupplychaincycle, and reducing wasteinthe production process, and acting competently, italso must be seen to include doingthingscorrectlyandin the right way.

EfficiencyinHOLSCMhasbeenusedinthe assessmentofsomeframeworksbycomparingtheirperformancebeforeandaftertheimplantation.MostoftheHOLSCMframeworkshave beenconcerned aboutthe efficientdispersalanddistributionregardingservicesand goodstotargetedcommunitiesi.e. (Crowley,2017;He,Liang,Deng,&Li,2018;M.Huang,Smilowitz,&Balcik,2012;Lu,Goh,&deSouza,2018;Siriwardana,Jayasiri,&Hettiarachchi,2018).Differenttechniqueshave been suggestedfordifferentsupplychainobjectives, including, for example, efficientcommunicationsenabling strongcooperationamonghumanitarianorganisationsandstakeholders(Carland, Goentzel, & Montibeller, 2018; Vojvodic et al., 2015). One technology-related application enhancing efficient communication is thenow well-establishedvehicleroutingandplanningofdisastermanagement, which is technology very much applicable forlogisticscostefficiency(Das,2018;M.Huangetal.,2012;Kelly,1995;Tatham,Loy,&Peretti,2015;Yu,Yang,Miao,&Zhang,2018).Someotherstudies(Crawford&Bryce,2003;Hasani&Mokhtari,2018;Ika,2009;Olsson,2007;Rezaei-Malek,Tavakkoli-Moghaddam,Cheikhrouhou,&Taheri-Moghaddam,2016;Yamin&Sim,2016)list technology whichcontributestoHOLSCMefficiency, including transportation,inventory management (including procurement),and disasterplanning systems, enabling themajorfocus toremainon the rapiddeliveryof goodsandservices.Usually,efficiencycanbeattainedthroughthe managementprocesses normallyknownas leanmanagement,and, of course, management's adherence to these processes. However, there arelack of studies in HOLSCM,whichhave demonstrated significant efficienciesachieved throughapplyingleanmanagementtechniques.

4.2.2 HOLSC Meffectivenessmanagement:

The contentofeffectivenessisoften usedinHOLSCMbutis rarelydefinedinclearterms.In HOLSCM, this conceptofeffectivenessrefers"todoingtherightthings"(Zidane & Olsson, 2017),suchasfocusingonprovisionofcommunitydemandingthings(food,shelter,sanitationetc.)to contributeinoveralloutcome(Sundqvistetal.,2014).This is clearly different to "doing the things right" which is the slogan appropriate to efficiency. AccordingtoZidane,(2017)effectivenessisaboutleadershipskillswhileefficiencyisaboutmanagementskills,thus,leadershipisproactiveto "doingtherightthings"whilemanagementhasalwaysstrivedto"dothethingsright, at the right way".Olsson2007,definedeffectivenessasaddingvalueforcustomersandusers,whichisanexternal typeofmeasurement.The effectivenessconceptinhumanitarianorganisations(suchasNGOs)istouseinputsin such a manner as to achieve maximum and optimal outputs to meet immediateobjectives(search&rescue,deliveryoffood,shelter&healthservices).The integration of research work by Barnett (2005) and Martens (2002) describes that the terms "HOs" and "NGOs" may be used reciprocally, but the theoretical traces emphasise that HOsperform therelief work without political interventions. The term "NGO"was initially used by UNO as a result of global destruction post Second World War. The NGO is a form of HO that can

nationally or internationally do the relief work for the greater good of society.Effectivenesscanbemonitoredthroughoutcomeindicators where theseoutcomesincludeapositivechangeinbeneficiary behaviour,congruence with the situationofcounterpartsassisting theircapabilitytobenefittargetedbeneficiaries,andtoenhancethe provisionofintegratedservicesforattainingoutputsandoutcomes.So HOLSCMeffectivenessmanagementcan best be definedas the prompt supply ofservices and goodsalong with related resources,within least duration, for humanitarian cause to the maximum number of recipients.These discussions are especially relevant to the external interactions of the organization, whereas the externaleffectiveness of these, can be assessed by measurement of the resultsandvaluesachievement.Most studies of HOLSCMarefocusedoneffectiveness which isachievedby the effective application of managementtechniques(Cozzolino, Rossi, & Conforti, 2012). This effectiveness is knownasagilemanagement(Oloruntoba & Kovács, 2015; Toyasaki, Arikan, Silbermayr, & Falagara Sigala, 2017).In these studies, HOLSCMeffectivenesshas been discussed in terms of responding to emergencyoperations(Condeixa,Leiras,Oliveira,&deBritoJr,2017;delaTorre,Dolinskaya,&Smilowitz,2012;Heetal.,2018;L'Hermitte,Tatham,Brooks,&Bowles,2016;Moreno,Alem,Ferreira, &Clark,2018;Narasimhan,Swink,&Kim,2006).Effectiveness in non-emergencyoperations, encompassing what we might term developmental operationsprocesses,has notgainedsignificantattention.Usually,effectivenessisconsideredasa term interchangeablewith efficiency,but thereisalackofstudieswhichhavefocusedon effectivenessandefficiencyasterms distinct in their own meaning.The termeffectivenesshas been much more widely explored and discussed than efficiency inHOLSCM(Charles,Lauras,VanWassenhove,&Dupont,2016;Crawford&Bryce,2003;Hasani &Mokhtari,2018;John,Gurumurthy,&Soni,2018;Rezaei-Maleketal.,2016).

4.2.3 Efficacy management:

Thetermefficacyisthe combinationof"efficiency"(doingthingsright)and"effectiveness"(doingtherightthings)(Riaz,Tahir,&Noor,2013).Efficacycan bedefinedas "doingtherightthingsright at the right time" (Zidane&Olsson,2017).Efficacymanagementmaybe achieved througha combination of managementskillsandleadershipskills(Zidane&Olsson,2017).Nardietal.,2013definedthetermefficacyas"theleveltowhichaspecificprocess,intervention,orservice,producesthedesiredeffectunderidealconditions".Efficacyinvolvesqualityprocesses and practices thatproduces optimal resultswith thepotentialtoleadtoaneffectiveoutcome(Nardietal.,2013).Humanitariansupplychainmanagementefficiencyandeffectiveness,orbothtogether, canbemeasuredthroughperformanceevaluation, which isthe measurementofoutputs,outcomesorperceivedsuccessesofthe organizationsupplychainoperationsinmeetingthe organization'sorproject'sgoals,budgetspending,schedulingandconsiderationofoperationalefficiency(J.-W.Huang&Li,2012;Wong&Wong,2014).The overallperformanceofsupplychainoperationsisdependentonsupplychainefficacymanagement(Rezaei-Maleketal.,2016).

Efficacycanbeachievedthroughamanagementtechniqueknownasleagilitymanagement.Leagility management has gained research attention in more recent times and is now widely applied in different industries, including manufacturing and the services sector. However, leagility management in HO sector has received little attention with few studies addressing this area of interest(Cozzolino et al., 2012; Scholten, Sharkey Scott, & Fynes, 2010).Inthe HOLSCMliterature,the termefficacymanagementis usedrarelyand,mostofthetime,efficiencyandeffectivenessare

termsthatoverlapeachotherandareoftenusedasbeing synonymousandinterchangeable(Zidane&Olsson,2017).It can be concludedthatto attainefficiency,effectivenessandefficacy,theimplementationoflean,agilityandleagilitymanagementtechniqueshave, together,vitalimportance.

4.3 Concepts of lean, agile and leagility in terms of efficiency and effectiveness:

4.3.1 Lean management in HOLSCM:

The thought school for Lean began during the 1980s, in light of the Toyota Production System, yet the word lean was used the very first time in 1990, by John Krafcik in his research work, as revealed in (Ohno, 1988). Lean administration alludes to accomplishing more with less assets, and primarily looks to limit squander, continuous improvement and work-in-progress, and to develop a cultivating environment for JIT (Just-In-Time) (Ohno, 1988).Leanness infers improvement in the general system of supply chain management, concentrating on cost minimisation (Cozzolino et al., 2012), which is similar to the function of what is understood as efficiency management.In terms of HOLSCM, 40% of spending budgeted has been accounted for as squandered, because of elements, for example, duplication of tasks, excessive outcome-less effort, absence of time to complete successful examination, and redundant coordination and sequence of exercises (Bealt et al., 2016; Day et al., 2012); Van Wassenhove (2006) talked about how HOs are financed and represented in various manners from various benefactors who are progressively requesting appropriate control and responsibility, straightforwardness and value for money (VfM) as a by-product of their sponsorship (Tomasini&Van Wassenhove, 2009; Antai et al., 2015). This outcome of investment is conceivable through improved, productive, operational execution, attainable by an expert administration approach and store network effectiveness, empowering proceeded with viable utilization of assets (Scholten et al., 2010).

In operational execution, the intriguing part is the conceivably unexpected and pressing progress and move from agile (speed) to lean (cost reduction) approach and thought process. During calamities, because of the direness of prompt needs and elevated levels of vulnerability, all processes of supply chain must concentrate on speed, and cost turns into an auxiliary factor. When the prompt dire tasks have been accomplished, and the proceeding with needs jobs have been characterized, which means better perceivability of the procedure important to help recipients, at that point productive cost drivers can be embraced at this stage (Tomasini&Van Wassenhove, 2009). In all circumstances, the requirement for a efficient HOLSCM framework requests a lean administration way to deal with coordinate nearby, territorial and focal level administration plans (Marcinkowski, 2017; McLachlin&Larson, 2011). Few studies are available that focus on lean management in HOLSCM(Cozzolino et al., 2012; Putnik, 2012; Scholten et al., 2010), and their focus is always on the HO's emergency operations. HO non-emergency operations remain ignored as academic and professional research areas.

4.3.2 Agility managementin HOLSCM:

The conceptualisation of agility at organisational level, recently characterized by the global consultancy, McKinsey and Co, titled as Agile Management, emerged in the mid-1990s, characterized by a gathering in the Iacocca Institute, a consultancy and research organization situated at Lehigh University (Rahimnia&Moghadasian, 2010; Ramesh &Devadasan, 2007). Readiness is an all-encompassing and vital thought and a "business-wide ability", revealing insight into all parts of a supply chain, including inside authoritative structures and exchange accomplices. The majorpurposeofAgilityManagementistobringeffectivenessto the

overalloperationsbyrapidly meetinguncertainandunstabledemandsituations in an orderly and well managed manner.

The aforementioned obviously implies meeting the challenge of unexpected calamities by the HOs. The most significant essential to accomplishing agility is the cultivation of a culture ingrained with enterprise stage agility interventions. In simple manner, the focus is shifted onto the people perspective of supply chain (Aitken, Christopher, &Towill, 2002; Christopher&Towill, 2000). So, service orientation is the pivotal point for humanised agility value prepositions reflected by adaptability and responsiveness, in contrast from cost leadership that are the market champ qualities of leanness. The HOs are notable for being trend setters of agile processes through adaptation of contingency protocols and pre-situating of stock. Different methods suggested for HOLSCM agility readiness are compact correspondence with its accomplices about the present circumstance, options of the suppliers that are marked for their resource deliverance urgency experience, deferment of provisions, cradle stock, developing of disaster quick response team and extension supply chain partnership relationships (Christopher, 2005; Das, 2018). The issues and challenges of vulnerabilities, complexities, unforeseen situations and targeted resource mobilisation make agile humanistic services the backbone of HOLSCM, particularly in tasks of debacle reaction which normally emerge out of nowhere and in incredible extent (Cozzolino et al., 2012).In HOLSCM, agilitymanagementhasreceived considerableresearchattentionbyacademicsandprofessionals, inhandlingemergencysupplychainoperations.Agilityprovides theflexibilitydemanded in emergency situations, where itcontributestoeffective disaster processes, and where theprioritysnotfocusedonsavingcostsbuton savinglives. InHOnon-emergencyoperations,agility is also required to meet changing prioritieswhen the organisation is called to meet a disaster situation. However, little can be foundinthe currentliterature that discusses this dichotomy of process demands of both non-emergency and disaster (emergency)situations.

4.3.3 'Leagility'managementin HOLSCM:

The literary expression of "Leagility" was presented in design of supply chain to limit resoluteness and overage inSC procedures by making it lean and agile. Its beginnings are implicit, yet various papers tending to SCM embraced the term. Leagility is the capacity to keep balance in agile and lean processes of SCM and managing the trade-offs between the two points of effectiveness and efficiency. The associated management triggers the efficacy, compound of effectiveness and efficiency, through composition of agility and leanness at distinguishable de-coupling point. This point is the conceptual demarcation where the strategic overlapping of agility and leanness is operationally inevitable as per the customer orientation (Rahimnia&Moghadasian, 2010). At different operational phases of supply chain management, lean and agility play their obvious and required role in the field, so application one does not exclusion of the other (Aitken et al., 2002; Christopher, 2005; Narasimhan et al., 2006; Scholten et al., 2010).The existing literature review depictions for management operations of HOs dealing with disasters have not been studied and researched for the situations excluding the climatic conditions (Childerhouse&Towill, 2000). Our stance capitalises on this absence of research focused applicability of Leagility at holistic level for HOLSCM, where prioritisation for implementation of Lean and Agility ought to be streamlined for forwarding the benefits to the targeted community (Tomasini, Van Wassenhove, &Van Wassenhove, 2009). No data was found in the existing available literature that has addressed this area of concern. Therefore, we propose the requirement for a self-assessment model to investigate circumstances dealing with pre and post implementation of Leagility and its noteworthy results, in order to fill this research gap.Furthermore, in terms

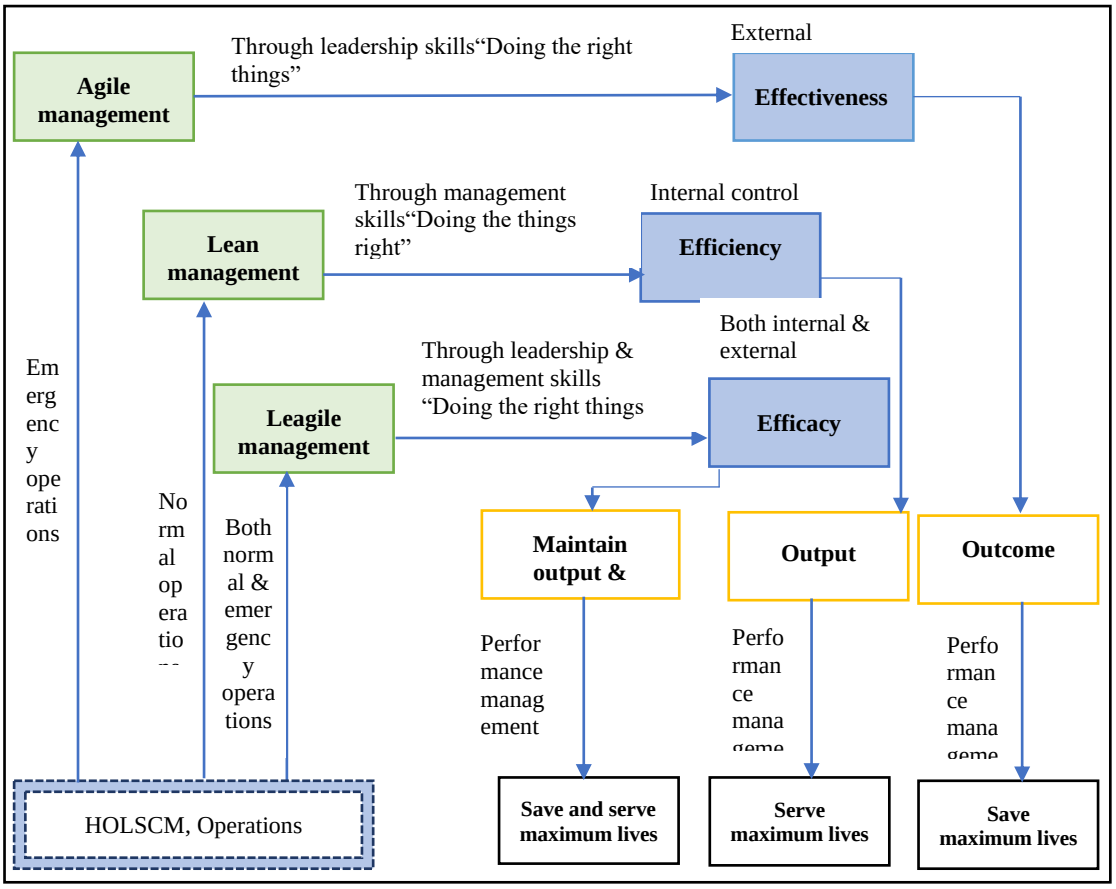
of efficiency and effectiveness, much of the research is on the agile management cycle connected to procedures that drive effectiveness because the dominant side of HO operations is the rapid response to disaster situations. This inclination towards agile process and effectiveness procedures negated the need of lean processes and efficiency procedures and made efficacy as an observable gap. So, this trend of trade-off, especially encouraged by academic reservoir available has to be shifted in order to establish holistic HOLSCM operations.

4.4 Performance management practices and processes in terms of efficiency and effectiveness:

Performancemanagementincludes theprocessesofquantifyingthe efficiency and effectiveness of HOLSCMoperations.Quantification of efficiencyandeffectivenesscanbeachievedthroughasetofkey indicatorswhichcontributetotheorganisations centralgoals(Neely,Gregory,&Platts,2005).Reportingthe performanceof both current and desired managementlevelsishelpfulforeffectivecontrol,correctionandcontinuousimprovement(Abidi,deLeeuw,&Klumpp,2014).Performance management is helpfulfor increasing accountability and transparency in supply chain systems and is also supportive inidentifyingtheproblems,wastes,improvementsareas,and successlevels whichfacilitate improvements in coordinationandco-operationbetweenstakeholders(Abidietal.,2014;Gunasekaran&Kobu,2007).Notwithstanding that measurementofperformanceinHOLSCMisacrucialtask,55%of HOshavenosuch performancemanagementsystems. Only 25%of HOsusesomeperformanceindicatorsandonly20%continuouslyfollowa consistentperformancemanagementsystem(Abidietal.,2014).In the arena of business, performance can be estimated through consumer loyalty which can be accomplished through long term relationship with the client and with all other value network partners. In business, the idea of the client is an individual whose necessities are meet by venders in exchange of compensation (Huang &Li, 2012). Moving the above idea to application inside HOLSCM, donor and beneficiary are two various types of clients. The donor is the upstream and beneficiary is the downstream client as per the flow of resources (Antai et al., 2015; Oloruntoba&Gray, 2009). As per the monetary reliance of an HO on its upstream clients, they have comparably much right of decision power (Antai et al., 2015). Nevertheless, the HO's operational capability is defined by their ability to balance the needs of the downstream and demands of upstream (Oloruntoba&Gray, 2009).There are few studies which addressed HOLSCM performance management (Helmig, Hinz, & Ingerfurth, 2015; I. van Hoek, Harrison, & Christopher, 2001; Merminod, Nollet, & Pache, 2014).In literary terms, to the best knowledge of the researcher, there is not a single conceptual modulation for the assessment of HOLSCM. Empirically, there is dearth of tools available for measuring the performance of HOLSCM as per the ISO and other standards. This means that the operational gap of integration of effectiveness and efficiency into efficacy has been reflected in management side in terms of agile to lean and then the case of leagility. This operational gap, management practices lapses and lack of integration of the two sides of the same coin is imperative for sustainable development in HOLSCM performance uplift globally, yet ignored till now (Beamon & Balcik, 2008; Charles, Lauras, & Van Wassenhove, 2010; Schiffling & Piecyk, 2014).

4.5 Development of HOLSCM Efficiency and Effectiveness Management Framework (EEFM)

HOLSCM Efficiency managemen trelates to savings of costs and the reduction of waste in the process, which enables HOs to "serve the maximum lives", while, effectiveness management enables HOs to deliver goods and services rapidly, which is essential in disaster situations, thereby contributing to "save the maximum lives". Each focus area discussed must be seen as being interrelated and each is dependent on the others. Figure 4 illustrates the detailed efficiency and effectiveness management framework.



4.5.1 Explanation of HOLSCM-EEMF:

Emergencyresponseoperationsare guided by the need"todotherightthings"rapidlywiththepurposetosavethe maximumnumber of lives and to mitigate to the fullest the immediate devastation of the disaster(He et al., 2018).Rapid, timely, deliveryofthe rightgoods and service ispossiblethroughquickleadershipdecisionandagilemanagementtechniqueswhichare"effectiveness" oriented(Christopher&Towill,2001;Cozzolino,2012).UsuallyHOLSCMeffectivenessandagilitymanagementaddress externalinteractionse.g.coordinationwithstakeholders(Tatham & Spens, 2016), and HOLSCMeffectivenesscanbeassessedbyoutcomes(i.e.savinglives). To assess disaster response outcomescontinuousperformancemanagementisnecessary(Crawford&Bryce,2003).

Prioritiesofthe non-emergency,developmental and on-going supporthumanitarianresponsesare"todothethingsright", that is, to deliverthebestvalueformoney,withthepurposetoservethe maximumnumber of peopleatthe

minimumcoststill commensurate withsatisfactoryquality. This canbeachievedthroughefficiencymanagement which, inHOLSCMefficiencymanagementterms, meansthe reduction in waste, if not the eradication of waste, toprovide maximum control overthe overalloperationalcost. This canbeattainedthroughskilfulmanagementaction, based on leanmanagementtechniques(Christopher&Towill,2001;Cozzolino,2012).Efficiencymanagement applies specifically totheorganization'sinternalcontrols,andefficiencycanbemeasured as theoverallcostofoutputs.Controlofcostsandreductioninoverallwastecanbemaintainedthroughcontinuousperformancemanagementsystems.InHOLSCMoperations,costefficiencyandtimeeffectivenessareboth criticalfororganisationalsuccesswhichcanbeachievedthroughefficacymanagement, which has been previously defined as encompassing bothterms:efficiency&effectiveness.InHOLSCM,efficacycanbeappliedinnon-emergency(developmental)operations.Efficacycanthen beseen as "doingtherightthingsright", a situation that can be achievedby both leanandagilemanagementtechniques together, which meansleagilitymanagement, a term first identified by Naylor, Maim and Berry in 1999.Resultsofefficacyandleagilitymanagementcanbeassessedinoutputsandoutcomesand, forthe attainment of better, or optimal,results,continuousperformancemanagementisnecessary(Figure4).This is not to say, however, that bothleanandagileparadigmsareno longer relevant forenhancementofcompetitiveness,costefficiencyandtimeeffectivenessintheHOLSCMoperations: they are!(R.Kovács,Oloruntoba,&Gyöngyi,2015;(Gligor&Holcomb,2012;Ismail&Sharifi,2006).

4.6 Review of HOLSCM operations (inventory, transportation and procurement management relevant studies:

The Efficiency and Effectiveness Management Framework illustrated in Figure 4describes the role and clear understanding of each term (efficiency, effectiveness, efficacy, lean, agility, leagility and performance management) in the HOLSCM context. Focusing on this framework, this study further reviewed the efficiency and effectivenessin HOs operationsresearch i.e. inventory, transportation and procurement management. In every operation efficiency and effectiveness relevant gaps are identified and conclusions drawn.

4.6.1 HOLSCM inventory management:

The efficiency and effectiveness of the HOLSCM inventory management is based on the yardstick of projective and contingent positioning of the resources and aligned as per the demand of the emergency situations considered normal for the HOs (Pettit &Beresford, 2009). Jha et al., (2017) presented a multi-dimensional model for HOLSCM to improve practices of resource alignment through cautious and methodological examination of supply-demand dynamics, considering risk of gaps between demand and supply situations. Operational flexibility issue was resolved utilizing numerical conditions, and the examination concentrated on the case of improving calamity related resources stacking, for example, nourishment, medications and other essential supportive things (Jha, Acharya, &Tiwari, 2017). Togainthebenefitsofpre-positioningof inventory,agroupofHOshavedevelopeda system of sharedcentralizeddepotscalled"UnitedNationsHumanitarianResponseDepots(UNHRD)", which maintain ready inventoryfor immediateresponsetodisasters(Dufour, Laporte, Paquette, & Rancourt, 2018).Some other studiesthat discussed HOLSCM inventory management were mostly concerned with pre-positioning of inventory(Baskaya, Ertem, & Duran, 2017; Ferreira, Arruda, & Marujo, 2018).

The significant point of literary and empirical concern extracted from the available academic and research reservoir for Humanitarian organisational interventions for management and response to disaster situations reflect dearth of lean management studies. Furthermore, there is acute shortage of studies that could guide and provide operational mapping of lean management in non-emergency work routines of HOs, while much focus is on agile management for handling emergency situations. This clarifies that lean is the area where much research work is needed to untap the value being underutilised for ages.

4.6.2 HOLSCM transportationor fleet management:

The fundamental reason of establishing HOLSCM is provision of humanitarian services to the 'last mile' in emergency and non-emergency situations (Eftekhar&Van Wassenhove, 2016; Moreno et al., 2018). The focal point of 'last mile' is the fleet management which makes it possible (Apte, 2009). This is the reason that about 15% of the total cost is exhausted by fleet management operations (Falasca&Zobel, 2011; Martinez, Stapleton, &Van Wassenhove, 2011). Therefore, route mapping and vehicle maintenance effectiveness and efficiency can reduce the cost overheads and risk of performance downfall (Dufour et al., 2018). Intelligent systems, coordination and control protocols play their role for fleet management issues (Berkoune, Renaud, Rekik, &Ruiz, 2012; Cao, Li, Yang, Liu, &Qu, 2018).

Interestingly, as in the case of inventory management, performance assessment and operational optimisation, the possibilities of cost-effective and lean fleet management practices in non-emergency situations are ignored, due to which, there is lapses of empirical sense and academic recognition.

4.6.3 HOLSCM Procurement operation management:

The capability of timely approvals, requisitions and acquisitions for the stream of goods and services required for disaster hit communities is dependent on the procurement experience and capability of the HOs. This is why 65% of the HOLSCM budgets are invested on the obtainment of resources (Falasca&Zobel, 2011). Therefore, effectiveness and efficiency achievement in the overall procurement cycle is vital for mission success, which starts from need analysis, contracts, vendor selections, inspection and audit of the required resources as well as various other process uptill the payment to vendors (Bhimani & Song, 2016; Büyüközkan & Göçer, 2018; Falasca & Zobel, 2011; Trestrail, Paul, & Maloni, 2009).

Achievement of HO activities is subject to opportune products and supplies deliverance, which is operationalised through mutual interest based relations with the suppliers (Nurmala, de Leeuw, &Dullaert, 2017). Falasca&Zobel(2011) suggested that products, supplies, and administrations for disaster situations ought to be acquired from indigenous markets which can probably deliver timely and will be proficient in cost because of transportation costs savings (Falasca&Zobel, 2011).The selection of the most variable local suppliers from the available ones is a tricky task for the HOs. It is recommended that both the corporate and HO sectors should learn from each other and both need to support operations management according to their special skills in supply management, logistics management, and inventory management (Bealt, Fernández Barrera, & Mansouri, 2016; Kusumasari & Alam, 2012; Li, Ramshani, & Huang, 2018; Lu, Goh, & De Souza, 2013; Maon, Lindgreen, & Vanhamme, 2009; Pettit & Beresford, 2009; Rueede & Kreutzer, 2015; Thomas & Fritz, 2006).

HOs maintaining good relationships with short-term engaged suppliers as a cost efficiency driver isdifficult andwas identified as a gap in the reviewed research. Procurementmanagement relevanttonon-emergencyhumanitarianoperationsis underexplored,particularlywhencomparedtoresearchintoemergencyphaseprocurementoperatio

ns.(Blecken & Tatham, 2010)showedthat71%organisationshavedifferentprocessesrelevanttothesametypeofoperations, making the provision of goods and services for the relief ofneedyandvulnerablecommunities unnecessarily complicated and potentially both ineffective and inefficient.

5. Notablegapsin HOLSCM research:

Descriptive analysis of published research showed that the empirical research methodologies have been appliedless frequently than analytical research methodologies, implying lost opportunities to apply statistical techniques in the HOLSCM research, especially given that most HO operations are governed in developing countries, andresearch into HOLSCMin developing countries is still sparse, so requires more serious attention. Thematic analysis identified asignificant gapintheliterature, that of efficiencymanagementinnon-emergencyHOLSCMoperations, whichare largelyignored, even though thechallengesandissuesofdisasterresponseandaidmanagementarewellreported.Ourviewisthatmore research attention to operational efficiency,particularlyofnon-emergencyoperations,is required.

The available literature on HOLSCM exhibited Agility management frameworks,andEfficientmanagement,asdiscussedbefore,butfew of these frameworksbeenwelltested as well as adopted.Noqualityassessmentandassuranceframeworkshavebeenassessedfortheiradherencetostandardizedframeworkswithineither ISOorthehumanitariansphere.MoststudieshavepresentedHO-Businesspartnershipframeworks,butnonepresentedastandardizedmodelwhichmaybeapplicable toeveryHOinpursuanceofeffectivenessandefficiency.Relevantstudies and frameworksforHOLSCMoperations(procurement,inventory,fleet)presentedvariousmeasurestopromoteeffectivenessbutthereisalackofresearchonoperationalefficiency.FleetmanagementofHOsundernon-emergencyconditionslackresearchonoptimizingresources,andnostudieswere found thatprovide guidance toorganisationsondevelopinggoodrelationshipsmanagementandsupply efficiency,suchasthatwhichcanbeachievedthroughshorttermengagementofsuppliers.HOsobjectivesarethesamebutHOLSCMpoliciesandimplementationproceduresvarysignificantly.Standardizationofpoliciesandproceduresisanotablegapintheresearchwhich may enable proactivemeasurestobe taken tobringaboutefficiencyinHOLSCM.

LeagilitymanagementisanimportanttoolforbringingbotheffectivenessandefficiencyinHOLSCM,andtheboundariesbetweenAgilityManagementandLeanManagementneedtoberedefinedindetailforbothdisasteranddevelopmentalHOLSCMoperationsalike.Furthermore,LeanManagementisanignoredareainHOsactivities andveryfewstudiesonorganizationalefficiencywere found,indicatinganeedtomoreextensivelyexploreefficiencyandLeanmanagementinHOLSCM.

6. Conclusion:

Inthispaper,wepresentareviewofexistingstudiesthat explorephase-wise efficiency and effectiveness in HOLSCM in emergency and non-emergency situations separately but ignored the trade off, which is explained by this study, starting from overall operations to major costing points of procurement, transportation and logistics. The HO'soperationalefficiencyandeffectivenessadjustmentsin terms of possible cost saving avenues through efficacy and development of HOLSCM-efficiencyandeffectivenessmanagement framework are the notable research gaps worked out.In theterminologyofHOLSCM, and for this

framework,effectivenessisachievedandmeasuredthroughagility,efficiencyisachievedandmeasuredthroughleanness, while efficacy is achieved and measured through leagility.So, the operational side is backed by the management side in order to have an eco-system of efficacy-leagility, which is encouraged by most recent studies, but not explained or studied. It is interesting to note that how human brain even follows leagility alike concept called sparse coding that is being used in variety of subjects now (Yu & Yu, 2017). For literary gap depiction, it has been observed HOLSCMeffectiveness(agility)hasgainedconsiderablymoreattentionthanboth efficiency(lean)and efficacy (leagility) management, due to which best practices for non-emergency situations for HOs are yet to be documented, as highlighted by this study.HOsoperations are applied inthe twomajorscenarios of disaster responses, requiringsudden andurgent response,andthenon-emergency developmentalHOLSCMoperational scenario, where carefuland considered planning is required,this study points out thatwhile bothscenariosdemandresearchattention,the developmentaloperational scenario has been neglected inpastresearch.Empirically, the cost savings through efficacy tactics and leagility management from overall operations, transportation, procurement and other HOLSCM procedures, can be re-invested, which would enhance donor confidence and scope of humanitarian operations. Moreempiricalresearchisrequiredtoprovidemorequantitative,well-constructedandwelltestedcasestudies,toprovide more applicable guidelines and processes for organizationaleffectivenessin the important domain of humanitarian operations.

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