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Humanitarian Relief Sustainability: A Framework of Humanitarian Logistics Digital Business Ecosystem

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Abstract

Natural and human-made disasters create humanitarian logistics constraints and some concern for governments, community stakeholders, and scientists. The impact of catastrophe generates unfortunate news headlines annually, including property lost. Despite the drive to improve humanitarian efforts, relief communities continue to face substantial logistical costs difficulty and reduced donor support. The purpose of this study is to use a systematic literature review coupled with an axiological philosophical lens approach to developing a Humanitarian Logistics Digital Business Ecosystem (HLDBE) framework as an alternative way to sustain the humanitarian logistics operations and reliefs through hybrid humanitarian- business logistics sector. Seven elements derived from the framework are collaborative blocks for establishing a sustainable HLDBE for relief logistics operations in creating of the financial reserve, capacity and empowerment building for domestic and international humanitarian logistics operations under a win-win opportunity for stakeholders. Implementation of this ecosystem will have a positive impact on affected economies. Future research direction is also proposed to further the research direction.

Keywords: Humanitarian Logistics Sustainability, Humanitarian Logistics Digital Business Ecosystem, Business Ecosystem, Systematic Literature Review

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1. Introduction

Humanitarian logistics constraints in response to natural and human-made disasters are subjects of much scrutiny and concern by global humanitarian actors, government, scientist and the public. These challenges are notably linked with famine, death, spreading of diseases, and displacement of beneficiaries in affected areas (OCHA (. N., 2018). It is noted that 80% of investment allocated to disaster relief is channelled to logistics operations and it is estimated that more than 35% of the funds allocated to logistics efforts are wasted due to humanitarian logistics constraints such as duplication of efforts by actors, lack of human resource to respond to crisis, limited financial support from donors and other contributing factors hinders the efficient and effective response to beneficiary needs when a disaster occurs (Jahre, 2016; Van Wassenhove, 2006; Kovács G. a., 2007; Nurmala N. J., 2018; Bealt J. J., 2016; Trunick, 2005). Recently, the United Nations Office for the Coordination of Humanitarian Affairs,' (OCHA) requested logistics support funds from the international community of over $400 million to support global relief efforts. Despite the request an amount of $213 million was funded leaving more than $190 million unfunded support for logistics operations (OCHA U. N., 2018). Such limitation coupled with humanitarian logistics constraints poses a risk to responding to global humanitarian aid for beneficiaries.

Logistics challenges mitigation in the humanitarian aid delivery sector comprises of a complex interrelated actors' collaboration from non-government organizations (NGO's), governments, research institutions, commercial companies and the public. Addressing these challenges requires the understanding of the effects and risk factors associated with humanitarian logistics response. Humanitarian logisticians have studied the challenges of humanitarian logistics (Kovács G. a., 2009; Van Wassenhove, 2006; Beamon, 2008; Oloruntoba, 2009; Thomas, 2006; Nurmala N. S., 2017)**.** The United Nations Office for Disaster Risk Reduction (UNDRR) in 2015 under the secretary general and other partners created the Sendai Framework, intending to utilize a collaborative effort in curbing humanitarian issues (United Nations - Headquarters (UN), 2015). Conscientious, efforts by commercial logistics companies collaborating together with humanitarian actors to support humanitarian efforts through a pro bono and resource capacity support. Such examples learnt from Universal Postal Service (UPS), Deutsche Post DHL, and others logistics companies who use their network, partners and resources to deliver relief aid to affected zones in globally (Kovács G. a., 2007; Nurmala N. S., 2017; Nurmala N. J., 2018). Adding to the views of several researchers on the importance of a hybrid collaboration between humanitarian - business logistics sector in addressing global humanitarian logistics is critically needed (Nurmala N. S., 2017; Kovács G. a., 2009; Abild, 2014; Bealt J. J., 2016)

Some researchers like Bealt et al (2016) used a mixed method approach to describe humanitarian- business collaboration efforts in supporting relief support. Despite the call from the humanitarian community to collaborate with international and domestic private logistics businesses in curbing humanitarian challenges and problems till date there are limited researches on humanitarian – business logistics actors collaboration. The purpose of this qualitative study is to propose a framework using a systematic literature review approach as a sustainable measure for supporting humanitarian logistics sector for both international and domestic humanitarian zones. This paper seeks to add to the

Sustainable Development Goal (SDG's) proposed by the United Nations (UN) in 2015 through the use of HLDBE concept (UN-DESA, 2015). The motivation of this study stems from the annual challenges humanitarian logistics actors in the sector encounter during humanitarian relief operations. This systematics literature review serves as a building block for future empirical studies (Seuring, 2012).

The paper is outlined as follows: section 2 as conceptual framework, section 3 as related literatures, followed by materials and methods in section 4, definition of HLDBE in section 5. Framework formulation in section 6, Discussion in section 7, and conclusion in section 8.

2. Conceptual Framework

On the concept of value creation and innovation, we employed axiological worldview in developing HLDBE sustainable framework tool for a hybrid humanitarian-business logistics aid delivery sector (Ihuah, 2013; Grünberg, 2000)

Gaining an elicit understanding and deeper meaning of the study, the proposed framework highlights concepts from collaboration theory, digital business ecosystem which underlines the value importance of creating an HLDBE to curb, prevent and sustain the growing demands from disaster operations globally (Schwartz S. H., 1987; Ihuah, 2013; Schwartz S. H., 2012).

We use **fig. 1** (as found below) as a guiding tool for our conceptual framework used (Miles, 1994; Crotty, 1998; Maxwell, 2012; Creswell J. W., 2017; Baffoe B. O., 2017; Creswell J. W., 2009; Ravitch, 2012).

Fig. 1: Graphical representation of the conceptual framework for Humanitarian Logistics Digital Business Ecosystem. Designed with Microsoft word 2019. Source: **By Authors**

3. Related Literature

3.1 Humanitarian Logistics Challenges

The annual rise in humanitarian problems springing out from conflicts, natural disasters prompts the humanitarian community (UN agencies, NGO's, government, private companies, etc) to develop and implement preparative measures to save life and property. Nonetheless, it is estimated that logistics a key element in humanitarian relief operations, takes up a huge chunk of the funds allocated for the mitigation, deploying and positioning of disaster relief to affected persons (Jahre, 2016; Trunick, 2005). Humanitarian logistics aid workers are faced with challenges such as less financial support from donors, duplication of efforts from different logistics actors who join in to assist in a disaster, information availability, transparency, coordination concerns (Jahre, 2016; Van Wassenhove, 2006; Kovács G. a., 2007; Nurmala N. J., 2018). For example: the some countries in the Middle East with conflicts issues faces relief challenges due to less funds to support the logistical movements of relief supplies and security to the affect areas (OCHA (. N., 2018). Logistics coordination issues, less donor support, duplication of efforts during the 2004 India

Ocean Tsunami, Haiti earthquake in 2010, Typhoon Haiyan in 2013, Nepal Earthquake in 2015 all are issue worth looking into for a better future (Besiou, 2018).

3.2 Digital Business Ecosystem

Recently, Digital Business Ecosystem (DBE) has gained much attention since the introduction of a business ecosystem by Moore (2006) to encourage the business world to mimic the biological concept of an ecosystem in sustaining, innovating and staying competitive in the market or industry they find themselves. DBE which serves as a collaborative network link of business actors to a common or technical complementary platform that other actors can link to with the sole aim of working together for a mutual benefits in the ecosystem by employing digital technology (Cusumano, 2010; Lin, 2010; Clarysse B. M., 2014; Williamson, 2012). Amazon, Alibaba, eBay, Facebook, Google, are some examples of digital business ecosystem platforms that attract many businesses (complementary) to the ecosystem. Integration of business entities in a business ecosystem creates value and opens new markets opportunities for already existing businesses or start-up companies through innovation (Adner, 2006; Kahney, 2004; Clarysse B. M., 2014). There are also concerns with dominance from key players, governance of the system, and it value creation mechanism. Using DBE is a good tool nonetheless a proper system design, governance, protection and operation is needed.

3.3 Collaboration Theory

Professor Eric Chaffee stressed that the current personality theory is now seen as collaboration theory that brings business stakeholders, government and non-government organization as a corporation through a collaborative effort and this collaboration efforts extend beyond the corporate entities to customers, society that prompt development (Chaffee, 2017; Osborne, 2018; Colbry, 2014). Humanitarian and business logistics entities collaboration through an ecosystem will bring win-win benefits to the humanitarian relief community, businesses and economies. Though collaboration is needed for sustaining one's operation, some stakeholders are also hesitant to collaborate as assurance is needed for it value creation and safety. Our proposed HLDBE framework hopes to address such concerns.

4. Materials and Methods

4.1 Study Design

The literature review was done under the guidelines for reporting systematic literature review studies (Uman, 2011; Liberati, 2009). Though systematic literature review encompasses a meta-analysis, we adopted the qualitative option by not using a meta-analysis for this study.

4.2 Search Strategy

This research aimed to collate relevant literature to design and propose HLDBE, as **Fig. 2** depict current humanitarian relief operations and **Fig. 3** the propose HLDBE. Using Shanghai Maritime University (SMU) library databases, related works of literature were searched from ScienceDirect database of more than 4,000 journals (Elsevier, 2019). Although there are vast number journals found in some databases such as Emerald Insight, Springer, and others, due to limited access of SMU's database in Emerald insight and other databases on related humanitarian logistics journals works, Elsevier ScienceDirect journals database was used for this study (Emerald Publishing Limited, 2019; Springer Nature, 2019). Literature searched were only in English with the time duration from 2015 to 2019. Because Sendai Framework for sustainability was developed in 2015, we employed the year 2015 as the beginning search year for this study (United Nations - Headquarters (UN), 2015). A period of five months was used in conducting the research (January 2019- May 2019). The Keywords string used for searching the literature are as follows: "Humanitarian Logistics AND Business Ecosystem", "Humanitarian Logistics AND Digital Business Ecosystem", "Logistics Ecosystem Platform", "MaaS", "Collaboration Incentive", "Humanitarian Logistics AND Big Data Analytics". Literature inclusion and exclusion were restricted to the "title" and "abstract" found in ScienceDirect journal database. Searching and selection of the literatures can be found in **Fig. 4**. Microsoft Excel 2019 was used in developing the bibliography for this research.

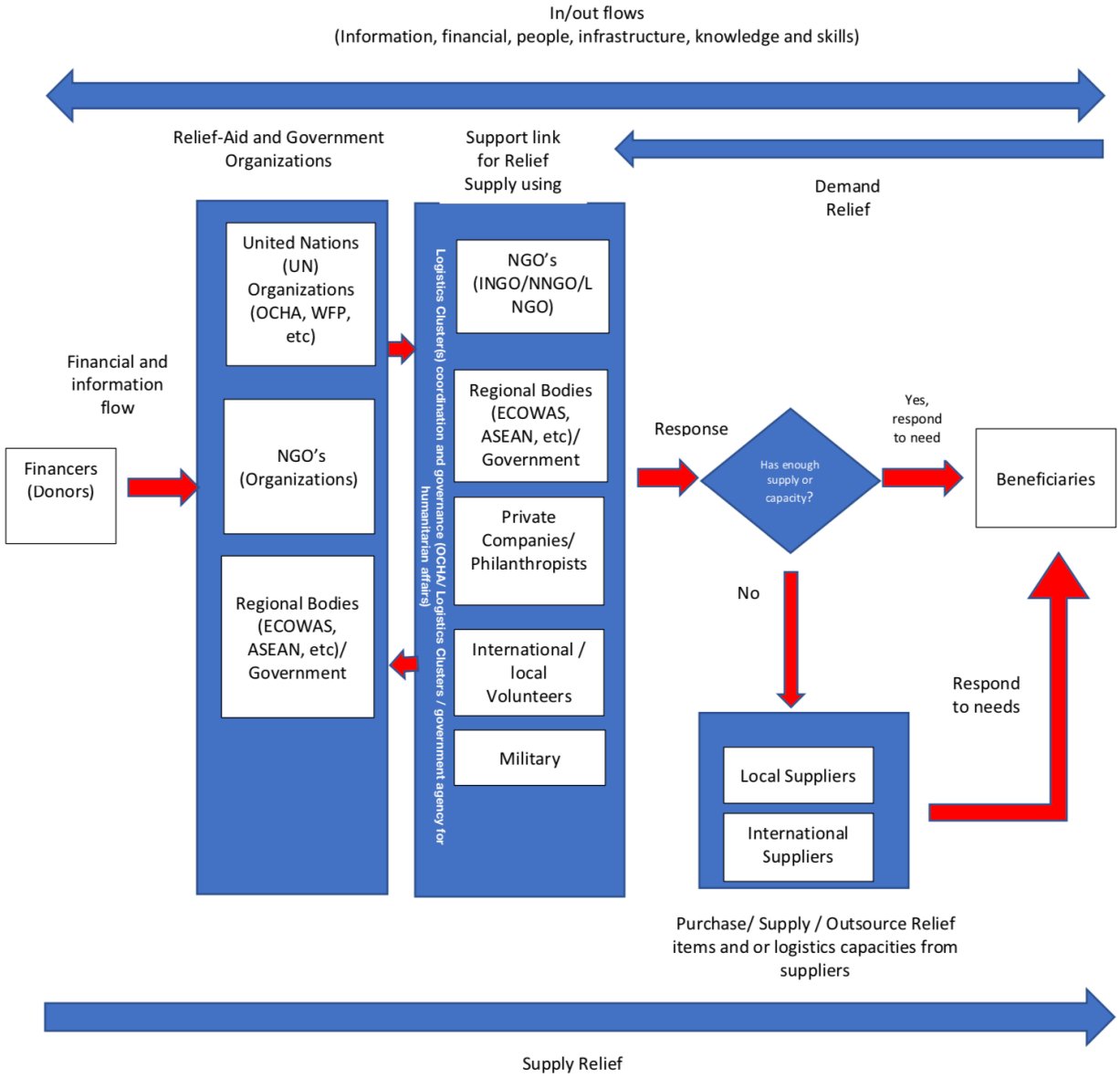

Fig. 2: Diagram for current financial, information and relief supplies flows between humanitarian logistics actors and other supporting entities. Designed with Microsoft word 2019. Source: **By Authors**

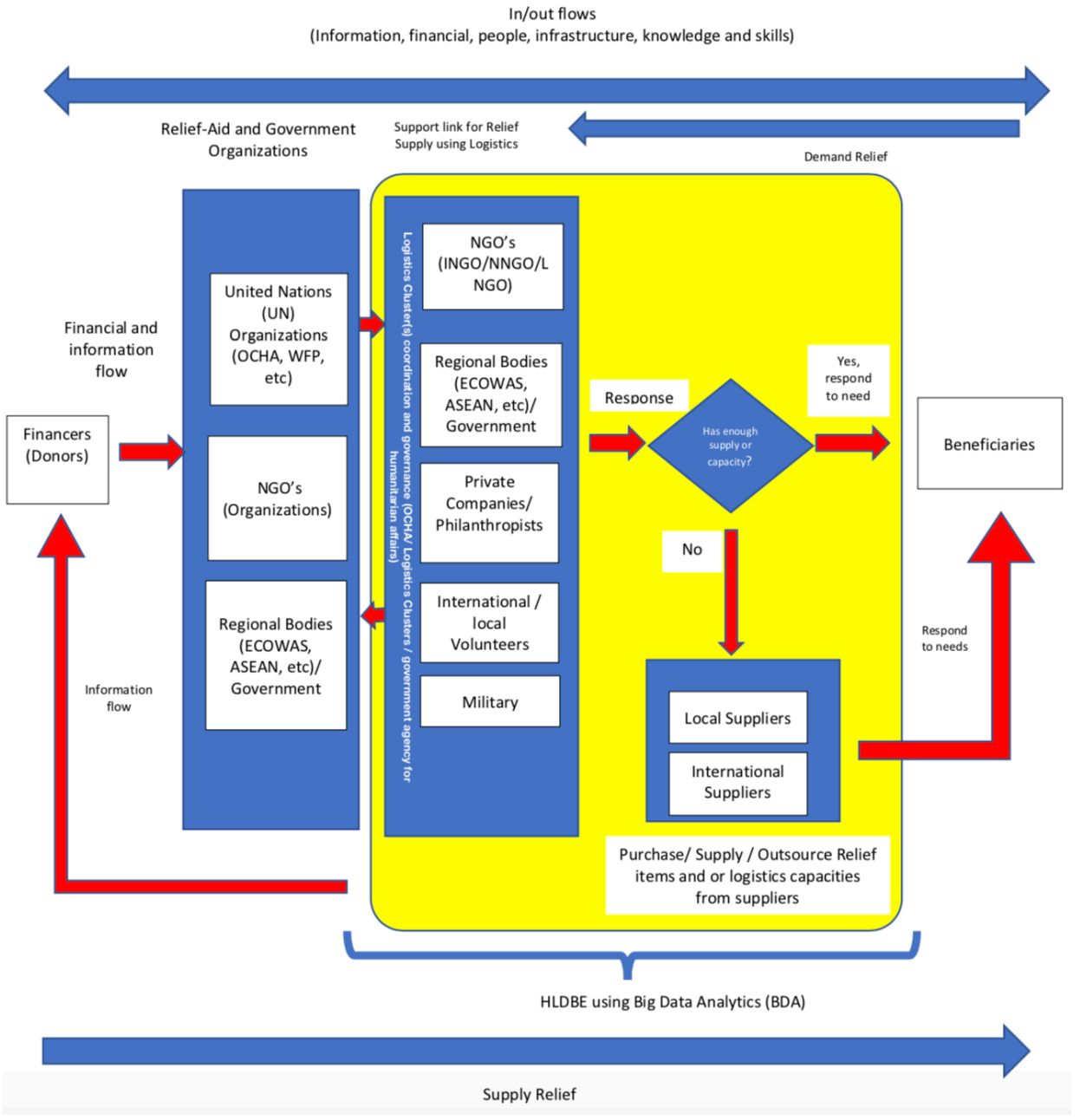

Fig. 3: Proposed framework diagram for HLDBE to support humanitarian logistics sustainability efforts. Designed with Microsoft word 2019. Source: **By Authors**

4.3 Screening Process and Eligibility Criteria

Screening was done by two investigators (B.O.K.B) and (L.A), independently and review was adjusted by (W.P.L) to ensure that the following inclusion criteria were observed: (a) Language: English, (b) literature: peer-reviewed articles without conference proceedings articles, see (Kelly, 2014; Nicholas, 2015) for more details, (c) Availability of paper: Open access, (d) Eligibility: studies were included if they meet the requirement of creating HLDBE framework by the researchers. Unit of analysis used are humanitarian logistics organizations and commercial logistics firms operating in both local and international settings. The rational for selecting this unit of analysis is because the elements used form part of the proposed HLDBE sustainable platform system discussed in this study (Vega D. , 2018; Patton, 2002). Even though this study is a humanitarian logistics field with humanitarian logistics search strings used, other multidisciplinary fields (health, education, and others) was obtained from the search to develop the framework. This prompt the importance of capturing different thoughts or knowledge applied in those field to address a solution. An example is taken from (National Research Council, 2012)

4.4 Data Extraction and Analysis

The extraction was done to mirror the objective of the study. Inclusion characteristics for HLDBE formulation include bibliographic information and the main findings. Data extraction was conducted by (B.O.K.B) and (L.A), with (W.P.L), ensuring the accuracy and completeness of data collected and analysed. The two of the research team were from the supply chain and logistics field with one from the humanitarian logistics field. Training was done to ensure that the collection and extraction of data is observed with minimum error. One author (B.O.K.B), assessed the quality of the method used in searching, extracting and recording of data as found in **Table 1**. Consistency in data collection, assessment and conclusion were done by two methods. Firstly, an individual studies review was done by (L.A) to ensure all key literature search, with findings, meet the search strategy and research scope. Secondly, we checked the review of (L.A) against (B.O.K.B) to ensure that all searches has no duplication and falls within the scope of the study. We found that all conclusions obtained are similar and consistent with the research study.

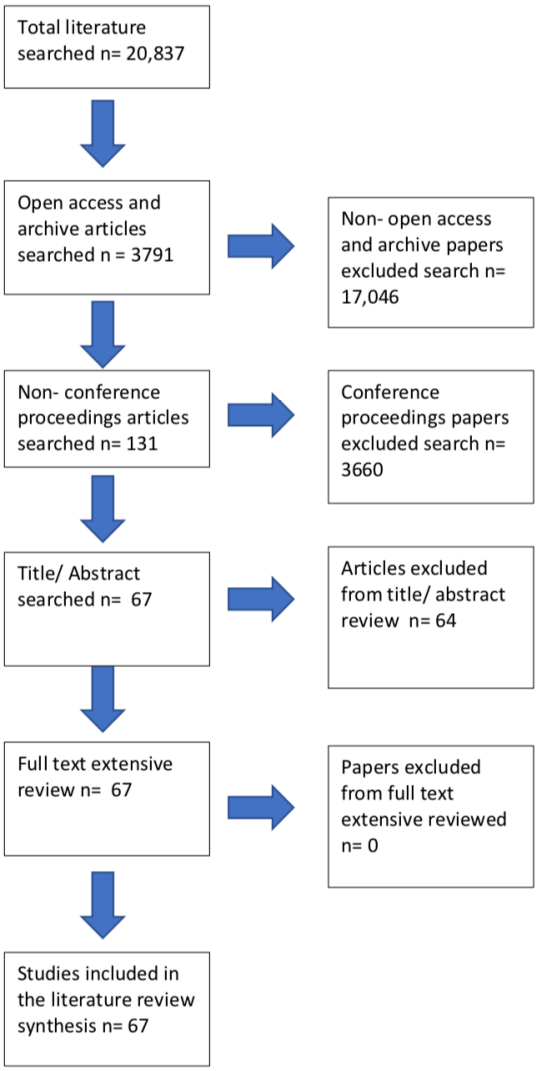

Fig. 4: Diagram for the searching and selection process for the systematic literature review. Designed with Microsoft word 2019. Source: **By Authors**

Table 1. Reviews of HLDBE Component (N= 67), Source: **By Authors**

Number of Paper	*Author(s)*	*HLDBE Component*								
		BDA	**E/ P**	**G&L**	**I&I**	**MC / I**	**O/ C**	**S**	**S&I**	**TARMIST**
1	(Dubey, 2019)	✓				✓				✓
2	(Mazzei, 2017)	✓			✓				✓	
3	(Horita, 2017)	✓								
4	(Raut, 2019)	✓				✓			✓	
5	(Perkmann, 2015)					✓				✓
6	(Tsujimoto, 2018)		✓			✓				
7	(Corradini, 2017)		✓			✓				✓
8	(Järvi, 2018)		✓							
9	(Grönholm, 2018)			✓		✓				
10	(Wolfe, 2017)			✓		✓				
11	(De Pietro, 2018)			✓	✓					✓

12	(Bugge, 2019)	✓			✓		
13	(Rechel, 2016)	✓					
14	(Trump, 2017)	✓					✓
15	(Boudreau, 2015)		✓				
16	(Gault, 2018)		✓				
17	(Roper, 2017)		✓	✓			
18	(Chen, 2018)		✓	✓		✓	
19	(Salandra, 2018)		✓				
20	(De Jong, 2015)		✓				
21	(Vickers, 2017)		✓	✓			
22	(Crescenzi R. a., 2018)		✓	✓			✓
23	(Schot, 2018)		✓	✓			
24	(Ashkenazi, 2019)			✓			

25	(Lopez-Vega H. F., 2016)		✓			
26	(Lopez-Vega H. F., 2016)		✓			
27	(Lawson, 2019)			✓		
28	(Sutherland, 2015)	✓				
29	(Crescenzi R. M.-P., 2016)	✓		✓		✓
30	(Hewitt-Dundas, 2019)			✓		
31	(Melchiorre, 2018)		✓	✓		
32	(Johnson, 2018)	✓	✓	✓		
33	(Prashantham, 2019)		✓	✓		
34	(Christiansen, 2018)			✓		
35	(Gupte, 2019)		✓	✓		
36	(Miozzo M. P.-f., 2016)	✓	✓	✓		✓

37	(Youtie, 2017)		✓			✓			
38	(Humphries, 2015)		✓		✓				
39	(Bechtsis, 2018)				✓		✓		
40	(Kamuriwo, 2016)				✓	✓			
41	(Eckhardt, 2018)	✓	✓		✓			✓	
42	(Nilsson, 2017)		✓	✓	✓			✓	
43	(Struckmann, 2018)				✓		✓		
44	(Ghiotto, 2018)		✓	✓	✓			✓	
45	(Leipold, 2018)		✓	✓		✓	✓		
46	(Milstein, 2016)		✓		✓	✓			
47	(Leijten, 2018)		✓		✓		✓		
48	(Pollok, 2019)			✓		✓		✓	
49	(Elwyn, 2018)					✓			
50	(Wiegmann, 2017)					✓			

51	(Blind, 2018)		✓		✓		✓
52	(Wilkens, 2016)			✓	✓		
53	(Schmidt, 2018)	✓		✓	✓		✓
54	(Rau, 2018)		✓			✓	
55	(Kafouros, 2018)		✓				
56	(Miozzo M. a., 2016)	✓	✓			✓	
57	(Vanino, 2019)		✓			✓	
58	(Li, 2019)			✓		✓	✓
59	(Prieto-Sandoval, 2018)		✓			✓	
60	(Tanskanen, 2017)			✓	✓		
61	(Suominen, 2017)						✓
62	(Galarza-Villamar, 2018)		✓	✓			✓
63	(Ashton, 2018)	✓		✓			✓

64	(Kreindler, 2019)	✓	✓	✓			✓
65	(Foege, 2019)		✓	✓	✓		✓
66	(Morescalchi, 2015)		✓	✓			✓
67	(Mathias, 2017)					✓	

Note: Big data analytics (BDA), Ecosystem/ Platform(E/P), Governance and Law(G&L), Incentives and Innovation (I&I), Multi-actor Collaboration/ Integration (MC/I), Outsourcing/ Crowdsourcing(O/C), Standardization (S), Sustainability and Investment (S&I), Transparency, Accountability, Risk Management, Information Sharing and Trust(TARMIST). Designed with Microsoft word 2019.

5. Definition of HLDBE

Due to the complex, agile, co-evolution, value creation ecosystem platform proposed in this study, we defined Humanitarian Logistics Digital Business Ecosystem (HLDBE) as *"a coordinated, collaborative, and shared ecosystem platform between humanitarian logistics actors and business logistics providers through the use of new generational technology and analytics to efficiently and effectively mobilize, manage and predict consumers and beneficiaries demands and supply needs by utilizing actors resources, skills and expertise to sustaining humanitarian logistics aid and business operation under a mutual benefit system without eliminating humanitarian principles, accountability, transparency, safety and security under an environmental friendly manner".* An ecosystem platform of different actors with different objectives would collaborate and coordinate among themselves when there is transparency, trust, mutual benefits, safety and security that look at improving their operations and the people they attend to (thus donors, consumers and beneficiaries).

6. Framework Formulation

6.1 Thematic

6.1.1 Big data analytics (BDA)

Big data analytics (BDA) has a positive effect on humanitarian logistics and commercial business logistics operations. In strategic decision-making, BDA's fields such as autonomous vehicles, borderless supply chains, predictive analytics, additive manufacturing and others are transforming the way of conducting business using supply-chain and logistics operations (Raut, 2019). BDA is a data dependent tool. Massive data obtained from several sources like social media feeds, customer buying patterns preference, enterprise resource planning (ERP), global position system (GPS), mobile devices serve as decision-making tools for an effective and efficient non-governmental organization and commercial business operation (Govindan K, 2018). Efficient logistics planning, scheduling, forecasting analytics, cost reduction and financial performance, transport consolidation, production and transportation optimization planning are some benefits of using predictive analytics to create value, competition and innovation for users (Mishra, 2016; Zhong, 2015; Shukla, 2016; Waller M. A., 2013; Waller M. A., 2013b; Govindan K, 2018; Yu, 2018; Choi, 2016; Davenport, 2008). According to Raut et al. (2019), BDA will bring many benefits to users if they are willing to employ or adopt new technology for their operation. BDA's development is based on the backbone of human and technological resources (technological software and hardware). For example in Finland, the use of Mobility as a Service (MaaS) as a digitize trend for transportation optimization helps to reduce emission, congestion, cost, and ensure easy mobility through the use of big data for operations in urban and rural areas (Eckhardt, 2018). Furthermore, the humanitarian logistics sector has a fair share of the benefits of using BDA in saving a life. Disasters mitigate, respond, and post-disaster response in Haiti, Brazil, and other countries are benefits of BDA use (Horita, 2017).

Big data analytics is among the sustainable tools for development. as employed in several sectors (education, fashion, medical), for more details see (Kannan, 2018; Choi, 2016; Davenport, 2008). Collaboration between the humanitarian logistic and private business logistics sector using big data analytics stands to benefits both users' operations. For example, in an event of a disaster, an ecosystem (thus HLDBE) actors in the affected zone can easily pull resources (such as transportation, warehouse, inventories, labour, accommodation, and others) from commercial logistics companies and vice versa in the ecosystem as they can quickly know how to easily mobilize available resources and needs through a natural sharing of information, capacity, knowledge and expertise through a transparent and accountable HLDBE ecosystem (Mazzei, 2017). This win-win opportunity enables commercial logistics actors to improve their operations and support humanitarian operations as not only a corporate social responsibility (CSR) obligation but as a sustainable means for both sectors. The lack of collaboration between humanitarian logistics sector and the commercial logistics sector will result in an inefficient and ineffective rapid response to disasters and business needs for future sustainability needs (Dubey, 2019). With the advancement of technology there would be a need to incorporate internet of things, blockchain, artificial intelligence, other upcoming cutting-edge technology to support and sustain a hybrid humanitarian business ecosystem (cum HLDBE) in the coming years.

6.1.2 Ecosystem Platform (EP)

This theme reflects on the cooperation among different actors ensures a hybrid loop of benefits and opportunities they can obtain from each other under the humanitarian cum business logistics field. We used an ecosystem platform as an outline to describe the environment the actors can co-exist in supporting each other succeed. Despite several types of the ecosystem such as industrial ecosystem, business ecosystem and others, Tsujimoto (2018) added multi-actor network system as an ecosystem for making room for multiple actors create value for themselves. For more details, refer to (Tsujimoto, 2018). HLDBE's concept is used to facilitate the fusion of the different model of operations for the humanitarian (for saving lives) and business logistics community (making profits). In affirmation to Corradini (2017), different actors collaborating, and sharing of knowledge and expertise creates a robust innovation environment and leading technologies that help them survive in operation. Owing to the facts that complex problems attributed to disasters are not easy to solve. Ecosystem environment of multiple actors (humanitarian-business logistics community) harnesses from their expertise, resources and capacity inputs and motives to address such humanitarian and business problems (Järvi, 2018). Despite the challenge of conflicts, dominance from major players, protection of information and others the HLDBE platform stands to serve users utilizing the digital platform for information exchange and sharing coupled with analytics operation used in their operation optimizations. In support of Prof. Michael Porter's Ted talk on "Why business can be good at solving social problems", when an environment such as HLDBE platform is created to help business logistics community benefits they will in turn help sustain the humanitarian logistics efforts thereby reducing the reliance on donor support (Porter, 2013). The promotion and improvements of service quality, efficiency and the promotion of innovative knowledge and expertise exchange enhances logistics operations optimization in the ecosystem. Despite the benefits actors will derive from the HLDBE, concerns such as data security, governance, financing of the digital ecosystem poses as a barrier to its adoption. The solution to our future humanitarian logistics aid support problems as nature depicts is the collaboration, cooperation and sharing of resources and expertise of multiple actors.

6.1.3 Governance and Law(G&L)

Lesson learnt from the health industry on the implementation of an ecosystem platform for health providers, and the patient can be a yardstick for the HLDBE. Switzerland has been successful in improving the quality of healthcare and service to patients by giving all actors access to relevant information through its Electronic Health Record (EHR) system platform. The platform helps actors and users to eliminate the duplication of information and efforts, optimize operation, reduce the cost of operation in encouraging the use of information and communication technology(ICT) cannot be achieved without legislative support (De Pietro, 2018). Again, lesson learnt from Norway's governance, urban waste system innovation and sustainability was achieved through the use of three government regimes, thus tradition bureaucracy, new public management, and networked governance. For more details, refer to (Bugge, 2019). An intersectoral and collaborative approach observed in synthetic biology regulation and governance ensure transparency, adaptability, safety and effective collaboration used in governing technologies and synthetic biology (Trump, 2017; Wolfe, 2017). Sutherland (2015), also use symbiosis to attribute to the governance of the agriculture

and energy sector on creating synergy, and value through their co-existence. Though there are uncertainties through the collaboration of cross- sector actors in the HLDBE ecosystem, the synergy of their capacity and policies as a complete system of operation will help to reduce the uncertainties relating to the governance of the actors under a shared platform (Grönholm, 2018). An ecosystem governance platform of humanitarian and business logistics actors cannot function without the support of local and national legislation (Rechel, 2016; De Pietro, 2018). Despite the importance of legislation from local and national government, there is a need to have an accepted regulation that cut across different sectors under the HLDBE platform to aid the smooth function of the system to support humanitarian sustainability efforts. The hybrid nature of different actors from different sectors call for lessons to be learnt from diverse sectors who has adopt cross-sector governance system that has helped in the operation and optimization of the sector as found in the health sector.

Private, domestic, national and international laws governing the setting up of the HLDBE regulations and laws applied as both non-business and business entity in the HLDBE can be legally recognized to do business or operate in a given geographical location unless given the permission to do so. Strict observance of such statutory laws and regulations enables HLDBE to be supported by domestic and international bodies thereby encouraging the sustainability of the ecosystem. Nonetheless, humanitarian principles cannot be eliminated from this ecosystem.

6.1.4 Incentives and Innovation (I&I)

Patents, creative commons, academic science, open source, ad hoc are some sharing initiative to foster innovation and create incentive among users. Where there is no or limited restricted platform there is an efficient replication of results, coordination and collaboration of a unified solutions tailored towards a high performance globally in their operations (Boudreau, 2015). During a disaster response, the collaboration among actors in sharing information and knowledge, training of employees and volunteers, capital transfer, capacity transfer and utilization encourages innovations in the ecosystem for development and productivity not only in the humanitarian relief area but in the business market as well (Gault, 2018).

With the importance of creating a local sustainable system for humanitarian logistics operation, the ability to harness external knowledge and expertise from business and non-business sector influences a force of innovation developments and incentive informing growth and sustenance (Roper, 2017; Chen, 2018; Gault, 2018; Crescenzi R. a., 2018; Schot, 2018). Patent acquisition has also been an attribute to innovation development. Though there are interest in how users in the ecosystem uses knowledge and resources, there is a need to not only focus on the incentives derived from it but also the relationship and governance to ensure a co-evolutive HLDBE ecosystem for driving economic growth and sustainable for both humanitarian - business logistics actors in response to a humanitarian crisis.

Furthermore, flaws or errors made during knowledge sharing among actors (thus from published academic literatures, codes and ethics and others) prompt mitigative solutions to be developed. Mitigation solutions such as intellectual property right, patents and others This prompt innovation and incentives development to be created in the ecosystem for users (Salandra, 2018; Vickers, 2017). Again, value of knowledge exchange among humanitarian

welfare of the society is improved (De Jong, 2015). Where care is not taken to ensure a systematic, ethical and legislative compliance of knowledge and resource sharing there exist a greater economic lost to the economy which in-turn affect actors' incentives obtained from the HLDBE. The ecosystem (HLDBE) is tailored toward supporting relief and business effort. De Jong (2015), then stress that when innovation is seen as a free sharing rather than having a profit value as a market transaction there would be less adoption and diffusion of innovation created in the platform. The collaboration of smaller actors with big players in the HLDBE ecosystem of logistics providers will aid in creating incentive and innovation among each other to develop economically and socially (Ashkenazi, 2019). The search of innovation knowledge outside a user (firm or organization) enables strategic planners to stay afloat in business or operation as it can be found in the work of (Lopez-Vega H. F., 2016). As lessons can be learnt from Israel's health system of creating a sustainable health sector (Brammli-Greenberg, 2016). HLDBE ecosystem innovation and incentive can be sustainable when an adaptive system is creative with the support of all users to encourage the growth of businesses, organizations in both local and international settings they operate.

6.1.5 Multi-actor Collaboration/ Integration (MC/I)

Natural existence of organisms relies on cross-collaboration to sustain it life. During a disaster as was the case during 2004 tsunami in Asia, 2010 earthquake in Haiti, Haiyan disaster in Philippians and others, the elimination of different actors and businesses coming together to respond to beneficiaries and economic development is inevitable. Locals and international logistics actors collaborate in areas such as warehouse capacity optimization and sharing, transport routing and capacity sharing, information and knowledge exchange, deployment of labourers to meet needs of over stretched relief workers and others are the powerful effects of a hybrid humanitarian and commercial logistics efforts to attend to economic and social issues (Lawson, 2019). This also having a greater pool of innovative actors, influences growth and productivity (Crescenzi R. M.-P., 2016; Leipold, 2018). It is also noted that the collaboration efforts of actors encourage risk to be shared among themselves (Hewitt-Dundas, 2019). Risk which sometimes can be very harmful to a small organization or firm is sometimes reduce when large companies collaborate in relieving much pressure and risk (Prashantham, 2019; Christiansen, 2018). Furthermore, the complex nature of response to disaster relief and the growing dynamic changes of market and consumer preferences calls for a knitted efforts of multiple actors and the use of technology in supporting their operations (Melchiorre, 2018; Gupte, 2019; Kamuriwo, 2016; Milstein, 2016). An HLDBE system with different actors in both humanitarian logistics and commercial logistics community stand the chance of harnessing their strength and capabilities to reduce weaknesses that will prevent them from staying in operation and growth (Johnson, 2018). The integration and collaboration of different actors in the HLDBE, not only improve local capacity but also attract foreign organizations to host countries which aid in innovation and capacity exchange and discourse for growth (Youtie, 2017). Collaborative centred efforts have an impacts on the reduction of emissions costs and waste thereby helping the environment maintain it ecological balance and operations (Bechtsis, 2018; Eckhardt, 2018; Nilsson, 2017). The alignment of users efforts and shared goal

benefits the ecosystem good performance, productivity, service quality for consumers and beneficiaries users alike (Struckmann, 2018; Ghiotto, 2018; Leijten, 2018).

Despite the advantage of collaboration and integration for knowledge, expertise and technological exchange there is a concern of competitors using shared information against another competitor in similar market operations which sometime can hinder a good collaboration ecosystem efforts as in the case of HLDBE (Miozzo M. P.-f., 2016). More so, different actors under the HLDBE ecosystem with different cultures, business models, funding mechanism, accountability and transparency system may pose a hinderance to the development of system tailored for sustainability of humanitarian and business logistics operations (Humphries, 2015). Addressing these challenges calls for an integrated, independent, fair regulated, productive ecosystem that will seek to promote co-evolution, value, efficiency and development for the benefits of all actors without dominance.

6.1.6 Outsourcing/ Crowdsourcing(O/C)

Challenges of responding to needs of beneficiaries and consumers in a dynamic and complex environment settings prompt organizations or firms to outsource function(s) of its operations for solution(s). In the humanitarian settings where uncertainty in achieving adequate transport, logistics, human resources capacities outsourcing and crowdsourcing are some ways employed by seekers (humanitarian logistics or commercial logistics actors) who may need assistance from other organization, firms, volunteers, logistics service providers, military (engineering, logistics regiment) in responding to the logistics and transport needs of it users (Vega D. a., 2015; Pollok, 2019; Kamuriwo, 2016; Tanskanen, 2017). Example can be learnt from the shipping and airline industry that collaborate using alliances and conferences to support their operations when need be. In the humanitarian settings of uncertainty and risks of losing life and property, harnessing expert knowledge and resources is crucial to the sustainability of the relief efforts (Tanskanen, 2017). An ecosystem platform of humanitarian and business logistics actors stands a better chance to address problems in any complex situation. Harmony among the outsourced actors through an efficient and effective transparent and accountable communication system encourage innovation and value creation among outsourced actors.

6.1.7 Standardization (S)

Standardization supports technological, socio-economic development. Standardization is seen as an *"important ongoing developments… towards a platform economy, making things 'smart' and innovating large, complex systems rely on standardisation"* (Wiegmann, 2017). Standards stemming from governments, markets, and groups ensure that users (companies or organizations) enjoys a harmonious, collaborative procedural process of operations understood by all to solve an identified problem facing a particular group. In this regards, standardized bodies such as International Organization for Standardization (ISO), American National Standards Institute (ANSI), International Electrotechnical Commission (IEC), World Wide Web Consortium (W3C), and others organizations which serves as non-profits or profits organizations serving the interest of an interested group are created to ensure that alignment among users

operations and conducts in both locally and internationally are observed and followed. HLDBE ecosystem platform which encompasses different actors with diverse mandates and functions stands to address humanitarian or business issues via it agreed and accepted standards of law(s) and practices for their operations. Such standards can be applied in packaging of products to affected areas (Kovács G. a., 2011). Logistics service providers, humanitarian logistics actors, immigration and customs of a country, volunteers, donors, non-government organizations and governments who play a role in the HLDBE platform who will promote humanitarian sustainability when under a common standard assisting in their operation and execution of duties (Blind, 2018). For example, humanitarian logistics operators from some advanced countries such as United States, UK, Switzerland responding to disaster with food and medicine provisions in developing or less developed countries with limited supplies to meet the needs of the beneficiaries, seldom rely on local food and medicine suppliers or even logistics facilities (transport, warehouse) in affected areas. These aid organizations sometimes are concern about the standards of local suppliers deemed by some humanitarian actors as acceptable for the beneficiaries who will need the suppliers. This prompt organizations to seek for international accredited firms to provide the suppliers. Sustaining the humanitarian logistics efforts with both commercial and humanitarian actors understanding and accepting standards that would help them work effectively in their supply of food, medicines does not only create a unified standard but also ensure the development of local capacity technology and innovation by complying to new standards implemented by the government and international organizations (Elwyn, 2018; Wilkens, 2016; Schmidt, 2018). Nonetheless, care should be taken on ensuring a good standard as some government, groups may decline sub-standard suppliers and products shipped into countries affected by disaster(s) when government is left out of the creative loop of standards tailored toward HLDBE.

6.1.8 Sustainability and Investment (S&I)

The concept of sustainability introduces in disaster efforts by Stenson, the global community in 2015 by the United Nations (UN) step up the importance of sustainability by incorporating into humanitarian operation the importance of helping to reduce death or casualties during a disaster impact. Additionally, S&I contributes to the economic development of a community or nation (Li, 2019; UN-DESA, 2015; Stenson, 2006). Looking at a long term perspective, the sustainability efforts in mitigating disaster response, and attending to post disaster issues should be tackled from the environmental, social and economic perspective using stakeholders involvement thus humanitarian aid operation or business logistics operations (Li, 2019). Humanitarian stakeholders such as volunteers, humanitarian logistics providers, donors, non-government organizations, military coupled with stakeholders from the business logistics settings operating in the warehouse, transport, customs of the country can collectively work in assisting in sustenance of each other via capacity and knowledge sharing.

Depending on other actors for external resource and knowledge helps an organization or actors to sustain it operations. The proposal of HLDBE platform with different actors in the business settings can be competitive and innovative through support obtained from external sources (Tanskanen, 2017; Prieto-Sandoval, 2018; Gault, 2018).

Humanitarian logistics sector will be sustained through resources shared from other partners externally in the delivery of relief supplies their operations tailored saving lives for both short and long term.

Investment serves as a major tool in HLDBE platform sustainable efforts of different actors. Rresearch and development (R&D) investments by non-government organization (NGO) and business improves the operational efficiency, innovation, co-evolution, value and performance of aid delivery (Vanino, 2019; Rau, 2018; Chen, 2018). Donors, philanthropists and other financiers' investment in relief and business operations ensure continues innovation and sustainability in the field (Mathias, 2017). In addition, geographical disperse location of actors also influences investment (Kafouros, 2018). Making the location of affected zones with external actors supporting investment to meet the longterm needs of beneficiaries. Due to the nature of disasters NGO's such as the Red Cross, IFRC, Jewish relief, Islamic relief and others stationed in affected areas sustains their operations and capacity locally and internationally by investing in sustainable tools that help them respond to humanitarian needs swiftly. Despite the advantages derived from research and development from actors in a platform, concerns that may arise for HLDBE users are the knowledge spill over to some users who may serve as competitors poses as a threat to some actors (Miozzo M. a., 2016; Roper, 2017). HLDBE platform sustainability stands to be achieved through a symbiosis and investment efforts of both internal and external actors in the system.

6.1.9 Transparency, Accountability, Risk Management, Information Sharing and Trust (TARMIST)

Openness in platform prompt actors to seek for the assurance of transparency, accountability, risk management (protection), trust and information sharing in HLDBE. The creation of value, risk protection for value appropriation of multiple partners is a hallmark for HLDBE formation (Foege, 2019). Key players in the platform with vast knowledge through R&D's turn to protect their information sharing through patent or intellectual property right acquisition as competition and knowledge spill over is bound to occur among different partners in the ecosystem (Morescalchi, 2015; Suominen, 2017). Humanitarian logistics actors operating under lifesaving mandates strives to ensure that transparency and accountability is shown in their operations to meet humanitarian principles whereas commercial actors also seek to bridge trust and accountability among their consumers and suppliers (OCHA, 2012; Kreindler, 2019; Ashton, 2018). The uncertainties and risks humanitarian and commercial logistics actors in the HLDBE may encounter can be minimized when resilience strategy system is put in place for a strong ecosystem. A co-existence of diversified parties in an ecosystem sustain and creates value in the system. Trust in HLDBE platform encourages innovation and togetherness aimed at achieving individual and collective objects through a collaborative effort.

The proposed framework can be found in Fig. 5 below.

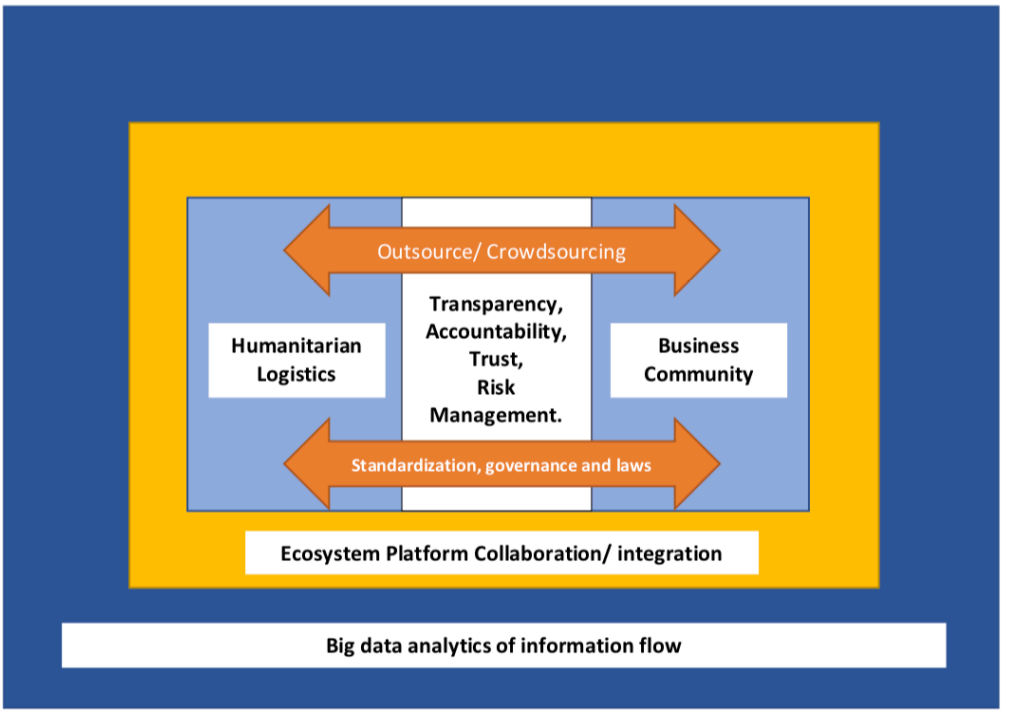

Fig. 5: Proposed framework diagram for HLDBE to support humanitarian logistics sustainability efforts. Designed with Microsoft word 2019. Source: **By Authors**

7. Discussion

Elucidation from works of literature indicates that using HLDBE proposed framework will aid in the humanitarian -business logistics collaboration for sustaining humanitarian efforts. With challenges faced in providing logistics support for relief distribution worldwide this framework would be a good way for the humanitarian field to start shifting their attention to being self-reliance through such ventures. Though the creation of such an ecosystem with big data analytics would be costly, partnering with big companies like Google, Cisco, IBM, Microsoft, NASA, Airbus, Amazon, Cainiao and organizations such as Gates foundations and other stakeholders in getting such analytical ecosystem infrastructure in place. The HLDBE ecosystem would be another source of revenue generation for humanitarian logistics operations. The HLDBE, when setup would help private logistics service providers who do not have such a technology to take advantage of it in improving their businesses (obtaining and analysing consumer preferences and demands, optimization of transportation routes, and others), entering into new markets, reducing costs, gaining innovative ideas through the ecosystem, benefits from logistics sharing capacity where waste can be eliminated from their operations.

Furthermore, domestic logistics service operators stand the chance to benefits from the ecosystem as their service would help supply them with experts on technical know-how to shift from their traditional mode of operation to a lean efficient and effective means of operations through standardization which at the end would have a ripple effect on the company and the economy. New jobs would be created at both urban and rural level as new field of expertise will be needed to support the ecosystem domestically and internationally. Crowdsourcing as an example in this context can strategically aid logistics service providers who cannot reach remote areas to utilize local resources to meeting their logistics network needs. More so, there would be the transfer of knowledge to users and beneficiaries thereby reducing the illiteracy rate.

The collaboration of humanitarian logistics and business sector would bring enormous benefits to disaster-affected zones and businesses in less developing countries as developing trends knowledge would be pass on to them. Though there are benefits, there still stand some constraints like the lack of infrastructure development which may pose a challenge in setting up HLDBE in some affected disaster countries. Yemen, Afghanistan, Democratic Republic of Congo, South Sudan, Central African Republic, just to mention a few as the countries are still struggling with security and disaster issues which do not encourage businesses to invest or humanitarian logistics operators to gain access to affected people. **Fig. 6** depicts a summary of the benefits or values the HLDBE would have on humanitarian logistics and business sectors.

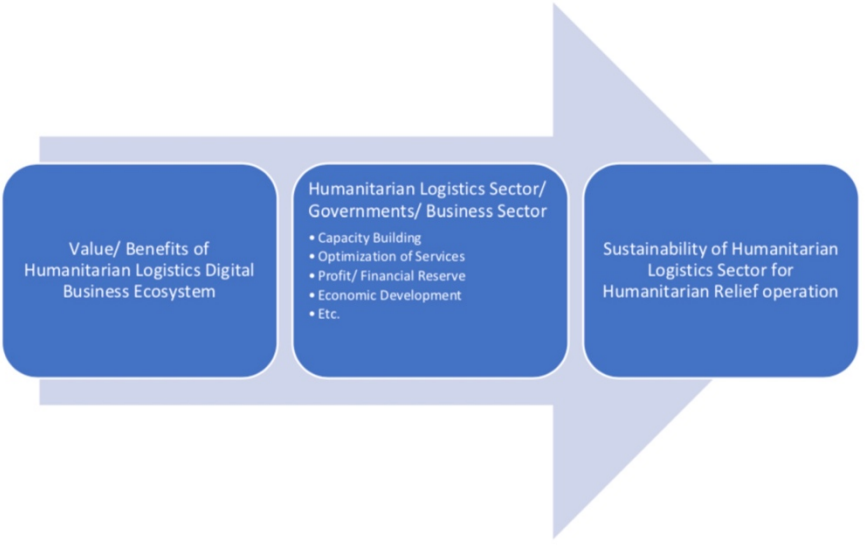

Fig. 6: Benefits from the proposed HLDBE to support humanitarian logistics sustainability efforts. Designed with Microsoft word 2019. Source: **By Authors**

8. Conclusion

The authors proposed a framework in a relatively new field of research "HLDBE" as a starting point for a more concentrated effort that will support the sustainability of humanitarian logistics operation through the collaboration between the business and humanitarian logistics sector in gaining a win-win benefit for meeting global disaster needs in developing local and international capacities. Although this study is not an empirical paper, this contributes to humanitarian logistics research by outlining seven key elements which help in the symbiosis of humanitarian-business logistics sector sustainable efforts towards elevating beneficiaries' plights and developing economies. Humanitarian and business logistics actors' challenges have and continue to be a significant concern for the global community on how to stay afloat when in need of expert knowledge, capacities, and funds. In this regards, we use Big data analytics (BDA), Ecosystem/ Platform(E/P), Governance and Law(G&L), Incentives and Innovation (I&I), Multi-actor Collaboration/ Integration (MC/I), Outsourcing/ Crowdsourcing(O/C), Standardization (S), Sustainability and Investment (S&I), Transparency, Accountability, Risk Management, Information Sharing and Trust(TARMIST) as a building block for encouraging a value-driven and co-evolutive ecosystem for harnessing actors resources and knowledge to meet disaster and commercial performance needs of their operations. Humanitarian principles should be factored in the platform development.

The authors outline the impacts of HLDBE; how funds could be harnessed from the ecosystem in supporting humanitarian logistics operations around the world, empower local capacity, minimization of illiteracy ratio, improve businesses operations. This all serves as some contributing factors to UN SDG goals.

The limitation of this paper is that there is no empirical evidence to test the framework proposed. Also, HLDBE framework in the current phase would best fit developing or developed countries with good technological infrastructure systems and laws. Nonetheless, empirical studies are needed in adopting this concept to some underdeveloped and developing country who are lacking behind in information and communication technology infrastructure and systems building development. Sadly, they struggle more in getting humanitarian logistics support during disasters; for example, countries like Indonesia, Nepal, Sudan, Cameroon, South Sudan, Yemen. Nonetheless, underdeveloped countries can also adopt this framework, as well but need to be customized to suit the real situation of the events domestically.

Despite the proposed framework, future studies should look at using empirical evidence from either the quantitative or qualitative research approach to further the study in areas such as profits sharing and financial reserve allocation. Also, ecosystem governance is a good topic to research into under HLDBE proposed area. Incorporating disaster management phases to the HLDBE study is a potential future research gap that needs to be addressed.

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References

Abild, E. (2014). Innovation and new ways of working across sectors. *Forced Migration Review, 101*(a00101s1), pp. 23-24.

Adner, R. (2006). Match your innovation strategy to your innovation ecosystem. *Harvard business review, 84*(4), 98.

Ashkenazi, Y. M. (2019). Using financial incentives to attract medical residents to the periphery: The Israeli experience. *Health Policy, 123*(1), 80-86.

Ashton, T. (2018). Measuring health system performance: A new approach to accountability and quality improvement in New Zealand. *Health Policy , 119*(8), 999-1004.

Baffoe, B. O. (2017). Subway emergency preparedness in Shanghai: A focused group and interview study exploring the perceived experiences of senior citizens and the disabled. *Journal of emergency management (Weston, Mass.), 15*(1), 29-48.

Bealt, J. J. (2016). Collaborative relationships between logistics service providers and humanitarian organizations during disaster relief operations. *Journal of Humanitarian Logistics and Supply Chain Management , 6*(2), 118-144.

Beamon, B. a. (2008). Performance measurement in humanitarian relief chains. *The International Journal of Public Sector Management, 21*(1), 4-25.

Bechtsis, D. N. (2018). Intelligent Autonomous Vehicles in digital supply chains: A framework for integrating innovations towards sustainable value networks. *Journal of cleaner production, 181*, 60-71.

Besiou, M. A.-M. (2018). OR applied to humanitarian operations. *European Journal of Operation Research, 269*, 397-405.

Blind, K. J. (2018). Publishing, patenting, and standardization: Motives and barriers of scientists. *Research Policy, 47*(7), 1185-1197.

Boudreau, K. J. (2015). “Open” disclosure of innovations, incentives and follow-on reuse: Theory on processes of cumulative innovation and a field experiment in computational biology.". *Research Policy, 44*(1), 4-19.

Brammli-Greenberg, S. R. (2016). Why and how did Israel adopt activity-based hospital payment? The Procedure-Related Group incremental reform. *Health Policy, 120*(10), 1171-1176.

Bugge, M. M. (2019). Governance for system optimization and system change: The case of urban waste. *Research Policy, 48*(4), 1076-1090.

Chaffee, E. C. (2017). The Origins of Corporate Social Responsibility. *U. Cin. L. Rev., 85*, 353.

Chen, J. X. (2018). Holistic innovation: an emerging innovation paradigm. *International Journal of Innovation Studies, 2*(1), 1-13.

Choi, T.-M. (2016). Incorporating social media observations and bounded rationality into fashion quick response supply chains in the big data era. *Transportation Research Part E: Logistics and Transportation Review*.

Christiansen, T. a. (2018). Hospital centralization and performance in Denmark—Ten years on. *Health Policy, 122*(4), 321-328.

Clarysse, B. M. (2014). Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems. *Research Policy, 43*(7), 1164-1176.

Colbry, S. M. (2014). Collaboration Theory. *Journal of Leadership Education, 13*(4).

Corradini, C. a. (2017). Beyond local search: Bridging platforms and inter-sectoral technological integration. *Research Policy, 46*(1), 196-206.

Crescenzi, R. a. (2018). The innovative performance of firms in heterogeneous environments: The interplay between external knowledge and internal absorptive capacities. *Research Policy, 47*(4), 782-795.

Crescenzi, R. M.-P. (2016). Do inventors talk to strangers? On proximity and collaborative knowledge creation. *Research Policy, 45*(1), 177-194.

Creswell, J. W. (2009). *Qualitative, quantitative, and mixed methods approach* (3rd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W. (2017). In *Research design: Qualitative, quantitative, and mixed methods approaches.* Sage.

Crotty, M. (1998). *The foundation of social research: Meaning and perspective in the research process.* Thousand Oaks, CA: Sage.

Cusumano, M. (2010). Technology strategy and management The evolution of platform thinking. *Communications of the ACM, 53*(1), 32-34.

Davenport, T. H. (2008). Competing on analytics: Inteligencia Competitiva para ganar.
De Jong, J. P. (2015). Market failure in the diffusion of consumer-developed innovations: Patterns in Finland. *Research Policy, 44*(10), 1856-1865.
De Pietro, C. a. (2018). E-health in Switzerland: The laborious adoption of the federal law on electronic health records (EHR) and health information exchange (HIE) networks. *Health Policy, 122*(2), 69-74.
Dubey, R. A. (2019). Big data analytics and organizational culture as complements to swift trust and collaborative performance in the humanitarian supply chain. *International Journal of Production Economics, 210*, 120-136.
Eckhardt, J. L. (2018). MaaS in rural areas - case Finland. *Research in Transportation Business & Management, 27*, 75-83.
Elsevier. (2019, May 15). *ScienceDirect*. Retrieved May 2019, from Journal and Books: https://www.sciencedirect.com/browse/journals-and-books?contentType=JL
Elwyn, G. H. (2018). A proposal for the development of national certification standards for patient decision aids in the US. *Health Policy, 122*(7), 703-706.
Emerald Publishing Limited. (2019, May 15). *Emerald Insight*. Retrieved May 2019, from Journals and Books: https://www.emeraldinsight.com/action/showPublications?&pubType=journal
Foege, J. N. (2019). Reconceptualizing the paradox of openness: How solvers navigate sharing-protecting tensions in crowdsourcing. *Research Policy* .
Galarza-Villamar, J. A.-Q.-L. (2018). Local understanding of disaster risk and livelihood resilience: The case of T rice smallholders and floods in Ecuador . *International Journal of Disaster Risk Reduction, 31*, 1107-1120.
Gault, F. (2018). Defining and measuring innovation in all sectors of the economy. *Research Policy, 47*(3), 617-622.
Ghiotto, M. C. (2018). Strengthening primary care: The Veneto Region's model of the Integrated Medical Group. *Health Policy, 122*(11), 1149-1154.
Govindan K, C. T. (2018). Big data analytics and application for logistics and supply chain management. *Transport Research Part E, 114*, 343-349.
Grönholm, S. (2018). A tangled web: Baltic Sea Region governance through networks. *Marine Policy, 98*, 201-210.
Grünberg, L. (2000). The mystery of values: Studies in axiology. *Rodopi, 95*.
Gupte, J. a. (2019). How do the state's organisational capacities at the micro-and macro-levels influence agriculture-nutrition linkages in fragile contexts?. *Food Policy, 82*, 74-83.
Hewitt-Dundas, N. A. (2019). Does learning from prior collaboration help firms to overcome the 'two-worlds' paradox in university-business collaboration?. *Research Policy, 48*(5), 1310-1322.
Horita, F. E. (2017). Bridging the gap between decision-making and emerging big data sources: An application of a model-based framework to disaster management in Brazil. *Decision Support Systems, 97*, 12-22.
Humphries, R. (2015). Integrated health and social care in England–Progress and prospects. *Health Policy, 119*(7), 856-859.
Ihuah, P. W. (2013). The pragmatic research approach: a framework for sustainable management of public housing estates in Nigeria. *Journal of US-China Public Administration, 10*(10), 933-944.
Izumi, T. a. (2015). *Overview and introduction of the private sector's role in disaster management.* Tokyo, Japan: Springer.
Järvi, K. A. (2018). Organization of knowledge ecosystems: Prefigurative and partial forms. *Research Policy, 47*(8), 1523-1537.
Jahre, M. A. (2016). Defining logistics preparedness: a framework and research agenda. *Journal of Humanitarian Logistics and Supply Chain Management, 6*(3), 372-398.
Johnson, M. P. (2018). Emerging trends and new frontiers in community operational research. *European Journal of Operational Research, 268*(3), 1178-1191.
Kafouros, M. C. (2018). Geographic dispersion and co-location in global R&D portfolios: Consequences for firm performance. *Research Policy , 47*(7), 1243-1255.
Kahney, L. (2004). Inside Look at Birth of the iPod. *Wired, 21st April*.
Kamuriwo, D. S.-F. (2016). Knowledge integration using product R&D outsourcing in biotechnology. *Research Policy, 45*(5), 1031-1045.
Kannan, D. (2018). Role of multiple stakeholders and the critical success factor theory for the sustainable supplier selection process. *International Journal of Production Economics, 195*, 391-418.

Kelly, J. T. (2014). Peer review in scientific publications: benefits, critiques, & a survival guide. *EJIFCC, 25*(3), 227.

King's College. (2012). *Platforms for Private Sector-Humanitarian Collaboration.* Retrieved February 2019, from LogCluster: https://logcluster.org/sites/default/files/kings_college_platforms_for_private_sector_humanitarian_collaboration.pdf

Kovács, G. a. (2007). Humanitarian logistics in disaster relief operations. *International Journal of Physical Distribution & Logistics Management, 37*(2), 99-114.

Kovács, G. a. (2009). Identifying challenges in humanitarian logistics. *International Journal of Physical Distribution & Logistics Management, 39*(6), 506-528.

Kovács, G. a. (2011). Trends and developments in humanitarian logistics–a gap analysis. *International Journal of Physical Distribution & Logistics Management, 41*(1), 32-45.

Kreindler, S. A. (2019). Primary care reform in Manitoba, Canada, 2011–15: Balancing accountability and acceptability. *Health Policy*.

Lawson, C. A. (2019). Citizens of somewhere: Examining the geography of foreign and native-born academics' engagement with external actors. *Research Policy, 48*(3), 759-774.

Leijten, F. R. (2018). The SELFIE framework for integrated care for multi-morbidity: Development and description. *Health Policy, 122*(1), 12-22.

Leipold, S. a.-B. (2018). The circular economy and the bio-based sector-Perspectives of European and German stakeholders. *Journal of cleaner production, 201*, 1125-1137.

Li, C. F. (2019). Organizational coordination in sustainable humanitarian supply chain: An evolutionary game approach. *Journal of Cleaner Production, 219*, 291-303.

Liberati, A. D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS medicine, 6*(7), e1000100.

Lin, Y. Y. (2010). Investigating the drivers of the innovation in channel integration and supply chain performance: A strategy orientated perspective. *International Journal of Production Economics, 127*(2), 320-332.

Lopez-Vega, H. F. (2016). Where and how to search? Search paths in open innovation. *Research Policy, 45*(1), 125-136.

Mathias, B. D. (2017). After the harvest: A stewardship perspective on entrepreneurship and philanthropy. *Journal of Business Venturing, 32*(4), 385-404.

Maxwell, J. A. (2012). In *Qualitative research design: An interactive approach* (Vol. 41). Sage.

Mazzei, M. J. (2017). Big data dreams: A framework for corporate strategy. *Business Horizons, 60*(3), 405-414.

Melchiorre, M. G. (2018). eHealth in integrated care programs for people with multimorbidity in Europe: Insights from the ICARE4EU project. *Health Policy, 122*(1), 53-63.

Miles, M. B. (1994). In *Qualitative data analysis: An expanded sourcebook.* Sage.

Milstein, R. a. (2016). The health care strengthening act: the next level of integrated care in Germany. *Health Policy, 120*(5), 445-451.

Miozzo, M. a. (2016). Growing fast or slow?: Understanding the variety of paths and the speed of early growth of entrepreneurial science-based firms. *Research Policy, 45*(5), 964-986.

Miozzo, M. P.-f. (2016). Innovation collaboration and appropri. *Research Policy, 45*(7), 1337-1351.

Mishra, N. a. (2016). Use of twitter data for waste minimisation in beef supply chain. *Annals of Operations Research*, 1-23.

Morescalchi, A. F. (2015). The evolution of networks of innovators within and across borders: Evidence from patent data. *Research Policy, 44*(3), 651-668.

National Research Council. (2012). Life sciences and related fields: Trends relevant to the biological weapons convention. *National Academies Press*.

Nicholas, D. A. (2015). Peer review: still king in the digital age. *Learned Publishing, 28*(1), 15-21.

Nilsson, A. (2017). Making norms to tackle global challenges: The role of Intergovernmental Organisations. *Research Policy, 46*(1), 171-181.

Nurmala, N. J. (2018). Cross-sector humanitarian–business partnerships in managing humanitarian logistics: an empirical verification. *International Journal of Production Research*, 1-17.

Nurmala, N. S. (2017). Humanitarian–business partnerships in managing humanitarian logistics. *Supply Chain Management: An International Journal, 22*(1), 82-94.

OCHA. (2012, June). *OCHA Message: Humanitarian Principles.* Retrieved June 2019, from https://www.unocha.org/sites/dms/Documents/OOM-humanitarianprinciples_eng_June12.pdf
OCHA, (. N. (2018). *Global Humanitarian Overview*. Retrieved August 2018, from http://interactive.unocha.org/publication/globalhumanitarianoverview/
OCHA, U. N. (2018). *Appeals and response plans 2018*. Retrieved May 2019, from Funding progress by sector: https://fts.unocha.org/appeals/overview/2018
Oloruntoba, R. a. (2009). Customer service in emergency relief chains. *International Journal of Physical Distribution & Logistics Management, 39*(6), 486-505.
Osborne, K. C. (2018). Flipping the Field: Using Football to Explain Corporate Personality Theory and the Ability to Opt Out of the Shareholder Wealth Maximization Norm. *Transactions: The Tennessee Journal of Business Law, 19*(1), 25.
Patton, M. Q. (2002). Qualitative research and evaluation methods.
Perkmann, M. a. (2015). Open data partnerships between firms and universities: The role of boundary organizations. *Research Policy, 44*(5), 1133-1143.
Pollok, P. D. (2019). Attracting solutions in crowdsourcing contests: The role of knowledge T distance, identity disclosure, and seeker status. *Research Policy, 48*(1), 98-114.
Porter, M. E. (2013, June 14). Why Business Can Be Good at Solving Social Problems. *TEDGlobal*.
Prashantham, S. a. (2019). Engaging with startups: MNC Perspectives. *IIMB Management Review*.
Prieto-Sandoval, V. C. (2018). Towards a consensus on the circular economy Vanessa Prieto-Sandoval*, Carmen Jaca, Marta Ormazabal. *Journal of cleaner production, 179*, 605-615.
Rau, H. G. (2018). From invisibility to impact: Recognising the scientific and societal relevance of interdisciplinary sustainability research. *Research Policy, 47*(1), 266-276.
Raut, R. D. (2019). Linking big data analytics and operational sustainability practices for sustainable business management. *Journal of Cleaner Production*.
Ravitch, S. M. (2012). *Reason and rigor. How conceptual frameworks.* Sage.
Rechel, B. A. (2016). Hospitals in rural or remote areas: An exploratory review of policies in 8 high-income countries. *Health Policy, 120*(7), 758-769.
Roper, S. J. (2017). Firms' knowledge search and local knowledge externalities in innovation performance. *Research Policy, 46*(1), 43-56.
Salandra, R. (2018). Knowledge dissemination in clinical trials: Exploring influences of institutional support and type of innovation on selective reporting. *Research Policy, 47*(7), 1215-1228.
Schmidt, I. J. (2018). The national program on standardized cancer care pathways in Sweden: Observations and findings half way through. *Health Policy, 122*(9), 945-948.
Schot, J. a. (2018). Three frames for innovation policy: R&D, systems of innovation and transformative change. *Research Policy, 47*(9), 1554-1567.
Schwartz, S. H. (1987). Toward a universal psychological structure of human values. *Journal of personality and social psychology, 53*(3), 550.
Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online readings in Psychology and Culture, 2*(1).
Senyo, P. K. (2019). Digital business ecosystem: Literature review and a framework for future research. *International Journal of Information Management, 47*, 52-64.
Seuring, S. a. (2012). Conducting content-analysis based literature reviews in supply chain management. *Supply Chain Management: An International Journal, 17*(5), 544-555.
Shukla, N. a. (2016). A fuzzy rough sets-based multi-agent analytics framework for dynamic supply chain configuration. *International Journal of Production Research, 54*(23), 6984-6996.
Springer Nature. (2019, May 15). *Springer*. Retrieved from Journals By Subject Area: https://www.springer.com/gp/authors-editors/journal-author/journal-author-helpdesk/journals-by-subject-area/5670
Stenson, J. (2006). Disaster management as a tool for sustainable development: a case study of cyanide leaching in the gold mining industry. *Journal of Cleaner Production, 3*(14), 230-233.
Struckmann, V. F.-v. (2018). Relevant models and elements of integrated care for multi-morbidity: Results of a scoping review. *Health Policy, 122*(1), 23-35.

Suominen, A. H. (2017). Firms' knowledge profiles: Mapping patent data with unsupervised learning. *Technological Forecasting and Social Change , 115*, 131-142.
Sutherland, L.-A. S. (2015). Conceptualising multi-regime interactions: The role of the agriculture sector in renewable energy transitions. *Research Policy, 44*(8), 1543-1554.
Tanskanen, K. T. (2017). Towards evidence-based management of external resources: Developing design propositions and future research avenues through research synthesis. *Research Policy, 46*(6), 1087-1105.
Thomas, A. a. (2006). Disaster relief. *Harvard Business Review, 84*, pp. 114-122.
Trump, B. D. (2017). TAPIC for the United States, European Union, and Singapore. *Health Policy, 121*(11), 1139-1146.
Trunick, P. A. (2005). Special report: delivering relief to tsunami victims. *Logistics today, 46*(2), 1-3.
Tsujimoto, M. Y. (2018). A review of the ecosystem concept—Towards coherent ecosystem design. *Technological Forecasting and Social Change, 136*, 49-58.
Uman, L. S. (2011). Systematic reviews and meta-analyses. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 20*(1), 57.
UN-DESA, D. f. (2015). *Sustainable Development Knowledge Platform*. Retrieved August 2018, from Sustainable Developement Goals: https://sustainabledevelopment.un.org/?menu=1300
United Nations - Headquarters (UN). (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030.* Sendai, Japan: United Nations Office for Disaster Risk Reduction (UNDRR).
Van Wassenhove, L. (2006). Humanitarian aid logistics: supply chain management in high gear. *The Journal of the Operational Research Society, 57*(5), 475-489.
Vanino, E. S. (2019). Knowledge to money: Assessing the business performance effects of publicly-funded R&D grants. *Research Policy*.
Vega, D. (2018). Case studies in humanitarian logistics research. *Journal of Humanitarian Logistics and Supply Chain Management, 8*(2), 134-152.
Vega, D. a. (2015). Humanitarian logistics: the role of logistics service providers. *nternational Journal of Physical Distribution & Logistics Management, 45*(4), 352-375.
Vickers, I. F. (2017). Public service innovation and multiple institutional logics: The case of hybrid social enterprise providers of health and wellbeing. *Research Policy, 46*(10), 1755-1768.
Waller, M. A. (2013). Click here for a data scientist: Big data, predictive analytics, and theory development in the era of a maker movement supply chain. *Journal of Business Logistics, 34*(4), 249-252.
Waller, M. A. (2013b). Data science, predictive analytics, and big data: a revolution that will transform supply chain design and management. *Journal of Business Logistics, 34*(2), 77-84.
Wiegmann, P. M. (2017). Multi-mode standardisation: A critical review and a research agenda. *Research Policy, 46*(8), 1370-1386.
Wilkens, J. H. (2016). The 2015 National Cancer Program in Sweden: introducing standardized care pathways in a decentralized system. *Health Policy, 120*(12), 1378-1382.
Williamson, P. J. (2012). Ecosystem advantage: How to successfully harness the power of partners. *California management review,, 55*(1), 24-46.
Wolfe, I. K. (2017). Child survival in England: strengthening governance for health. *Health Policy, 121*(11), 1131-1138.
World Food Programme. (2012, September 12). *World Food Programme*. Retrieved February 2019, from TNT And WFP Celebrate 10 Years Of Partnership: https://www.wfp.org/stories/tnt-and-wfp-celebrate-10-year-anniversary-partnership
Youtie, J. Y. (2017). Institutionalization of international university research ventures. *Research Policy, 46*(9), 1692-1705.
Yu, W. R. (2018). Data-driven supply chain capabilities and performance: A resource-based view. *Transportation Research Part E: Logistics and Transportation Review, 114*, 371-385.
Zhong, R. Y. (2015). A big data approach for logistics trajectory discovery from RFID-enabled production data. *International Journal of Production Economics, 165*, 260-272.