

From Disaster to Development: A Systematic Review of Community-Driven Humanitarian Logistics

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Abstract: There remains a plethora of untapped resources which exist within disaster affected communities, able to address both relief and development concerns. A systematic review of the literature revealed that communities are able to form ad hoc networks which have the capabilities to address a wide range of disaster management needs. These networks, known as Collaborative Aid Networks (CANs), have demonstrated efficient logistical capabilities exclusive of humanitarian organisations (HOs). We propose CANs offer alternative solutions to traditional humanitarian approaches to logistics, whilst also mitigating the challenges commonly faced by traditional HOs. Furthermore, the impact that CANs have on development as a result of their involvement in humanitarian logistics, highlights a more holistic, long-term approach to disaster management. This research provides the foundation for further theoretical exploration of effective and efficient disaster management, and opportunities for policy and practice.

Keywords: *Humanitarian Logistics; Disaster Management; Community; Disasters; Development*

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1. Introduction

As the social and economic impacts of disasters continue to rise, and humanitarian contexts become more complex, improving humanitarian logistics (HL) has become an increasing concern. Efficient and effective logistics practices are able to pave the way for successful relief and development as these processes include numerous activities focused at improving resilience and reducing vulnerabilities (Takasaki, 2013). Subsequently, there has been an increasing effort to understand the challenges and barriers of implementing successful HL operations. Such studies have addressed a plethora of complications including: coordination and collaboration between stakeholders, communication difficulties and barriers to information sharing (Bharosa, 2009; Comfort, 2007; Day, 2012; Maiers, 2005; Takasaki, 2013), the intricacies and uncertainties of disaster contexts, and the complexities of bridging cultural gaps during humanitarian operations (Beamon et al., 2010; Coles et al., 2012; Pettit and Beresford, 2009; Stumpfenhorst et al., 2011). As a result, there have been calls for greater transparency and cost-effectiveness of humanitarian operations and closer examination of whether the needs of disaster-affected communities are being met (Howden, 2009, Rodon et al., 2012; Saab et al., 2008). One characteristic still missing from this debate concerns the ways in which communities participate and engage in HL activities in order to improve the efficiency and effectiveness of such processes (Sheppard et al., 2013).

In relation to long-term development, it has been argued that real progress for beneficiaries can only be made through the decentralization of traditional top-down approaches and increased community participation (Das Gupta, Grandvoinnet and Romani, 2004, Lyons, 2009). Additionally, the demand for efficient and equitable distribution of goods and services, and the need to address threats to livelihoods, are conditions which are conducive to effective community action through self-organisation (Jones et al., 2013). Furthermore, “augmenting the capacity for effective disaster management is critically important”

(Takasaki, 2013); despite this, there have been limited studies which address the ways in which social networks are able to adapt and respond to external factors; including the implications of such developments on community and household vulnerability reduction, development and risk management (Baird and Gray, 2014).

The overarching paradigm is still humanitarian organisation (HO) -centric; that is to say, the focus remains on the ways in which external, foreign aid structures enter a disaster-affected community and actively organize them. Slowly the paradigm has shifted to an approach which refutes that the international humanitarian community has exclusive expertise and capacity for disaster response (Sheppard et al., 2013). Despite this, it has been argued that community participation has become nothing more than rhetoric, “with many disaster management initiatives paying little more than lip service to participatory ideals and failing to change the substance of their approach” (Méheux et al., 2010: p. 1110).

Although such inclusions marks some development in moving away from a victim perspective to a beneficiary perspective (Kovács et al., 2010; Slim, 2002), practitioners and academics are still failing to address pre-existing networks and organisations which have the capacity to run independent disaster management programmes within the community, for the community. To date HL research ‘has focused to a large extent on humanitarian organisations and their supply chains without considering beneficiaries as playing any active role in these’ (Kovács et al., 2010: p. 412).

This research therefore aims to explore a small and emerging body of disparate literature which has begun to document community-driven efforts in humanitarian operations. The most notable example is that of ad hoc networks of Churches and community groups in Haiti, which ran highly successful relief operations in the aftermath of the 2010 earthquake. Often these networks vastly out-performed many experienced HOs (Holguin-Veras et al., 2012b);

they have been coined by Holguin-Veras et al (2012b) as Collaborative Aid Networks (CANs). The success of these local organisations has prompted this research to explore the logistical capabilities of CANs in all disaster phases and the impact of their involvement in disaster operations. This is an important area to address as it will facilitate the recognition of socially embedded networks already present within a society. Furthermore, by exploring the capabilities of such networks, some of the HL and societal challenges associated with humanitarian operations may be mitigated due to the structure and social compositions of these groups.

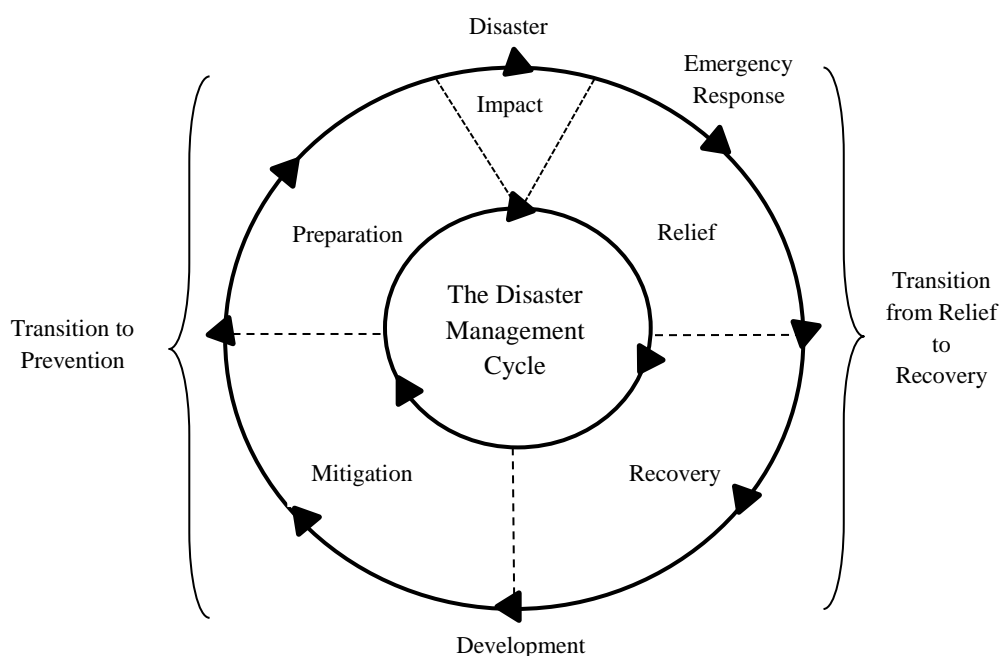
The article first introduces the challenges associated with humanitarian operations and the recent recognition of community-led HL as an alternative structure. The following section provides the results of a systematic literature review and key themes for discussion. Next we discuss the range of logistical capabilities demonstrated by communities, independently of external humanitarian bodies, and then reveal the subsequent impacts of such engagements on development. Finally, we present the conclusions and suggest directions for future research.

2. Challenges in Humanitarian Operations

This research categorizes humanitarian organisations such as the United Nations and Non-Governmental Organisations (NGOs) as organisations which are ‘foreign’ with a ‘traditional HL’ structure. We use Holguin-Veras et al (2012b)’s definition of foreign groups which are defined as: “any group (which may be from the impacted country or another), but are not incorporated into the local social fabric of the impacted area” (p. 1626). This is further supported by Long and Wood (1995) and Kovács and Spens (2007) who describe relief as a “foreign intervention into a society with the intention of helping local citizens” (Long and

Wood, 1995: p. 213). This research will further add that the practices of, and actors involved in traditional HL, may not be understood by the impacted community to be analogous with the context (Fritz Institute, 2005; Régnier et al, 2008; Stumpenhorst et al., 2011).

In order to contextualize the changing dynamics of a disaster context, the notion of a disaster management cycle was conceptualized (Figure 1), and is commonly understood to develop through four stages including: relief, recovery, mitigation and preparation (Tatham and Spens, 2011).



(Adapted from Tatham & Spens, 2011)

Figure 1. The Disaster Management Cycle

With the vast number of actors involved in HL, communication is often poor, which in turn damages scope for collaborative relationships (Wild and Zhou, 2011). Poor coordination amongst HOs, and their lack of commitment to it, has been cited as the main cause of gaps in performance (Cozzolino, 2012). Alongside this, recurring failures to bridge the gaps between relief and development have also been cited as reasons for inefficacies (Balcik et al., 2010;

Bharosa, 2009; Kovács and Spens, 2009; Sandwell, 2011). Competition for funding, media attention and scarce resources also result in breakdowns in collaboration, coordination and communication (Sheppard et al., 2013; Stephenson and Schnitzer, 2006; Wee et al., 2014). Furthermore, increased pressure upon HOs to be transparent tends to push HOs towards an upward accountability to the donor rather than towards the needs of a population (Hedlund and Knox-Clarke, 2011; Sandwell, 2011; Stumpfenhorst et al., 2011).

2.1 Community-Driven Logistics Structures

Traditionally research has focused on the ways in which large NGOs, militaries and third party logistics providers have addressed HL challenges. Recent literature has seen the emergence of the role of community and religious networks in affecting social change. This is due to the recognition that these networks act as channels through which accurate information regarding needs and priorities can be disseminated, and greater efficiency can be ensured through the use of local material and intellectual resources (Matopoulos et al., 2014; Méheux et al., 2010).

As a result, costs and time restraints associated with using external actors can be reduced (Sheppard et al., 2013), as is the pressure on such organisations (Méheux et al., 2010). Subsequently this also allows for communities to become more actively engaged in their own relief and development.

These voluntary organisations are also becoming recognised due to the increasing distrust populations have of government sectors, and their perceived lack of services (Fois & Fornio, 2014; Guo et al., 2012; Cnaan and Curtis, 2012; Cnaan et al., 2002). In addition, the notion of collective action, defined broadly as cooperation amongst individuals, has also begun to address issues of communication, trust, reciprocity and equity (Beitl, 2014; Lyons, 2009;

White and Runge, 1995). However, very little research has addressed examining these structures as an alternative to traditional HL.

In order to clearly define what is meant by ‘traditional HL’ or an HO-centric approach, a distinction must be made between the organic, grassroots activities detailed in this paper and the ambiguous world of implementing partners (IPs) and local chapters. IPs have been defined as “the institutional entity entrusted with, and fully responsible and accountable for successfully managing and delivering project outputs” (Pedraza Martinez et al., 2011 p.405). Such organizations have increasingly become utilized by HOs due to inefficiencies associated with traditional hierarchical, centralized approaches (Kapcu and Garayev, 2011). Often these partners are local NGOs or local chapters; the latter is most commonly associated with organisations such as the Red Cross/Crescent (Matopoulos et al., 2014). The decentralized organizations support locally-run branches in numerous districts across a country.

Whilst these partners may be organised locally and within the affected disaster region and have a better understanding and connection with local people (Matopoulos et al., 2014; McLachlin, 2009), they are not considered by this research to wholly reflect community participation. The justification for this lies in the definition of a foreign group which, despite potentially coming from an impacted country, have not organically or autonomously arisen. IPs for example are still subcontracted by HOs (Pedraza Martinez et al., 2011), therefore internalising the outcomes of an external institution. Similarly, local chapters exist under the mandate of larger, foreign organisations with potentially differing priorities, perceptions and ethos.

Examples of this are community-based disaster preparedness (CBDP) programmes, which deliver projects which are aimed at empowering communities to manage their own disaster risks (CRS, 2010). In addition, interesting research by Sodhi and Tang (2014) suggests

utilizing the poor within a society for distribution of goods or even as suppliers (Sodhi and Tang, 2014). Whilst these approaches aim to reduce vulnerability and mobilize existing capacity, they are still often managed by organisations from unfamiliar environments, with unfamiliar politics and paradigms guiding the projects.

The concept of framing these indigenous networks as alternative logistics structures originated from Holguin-Veras et al (2012b)'s research on Collaborative Aid Networks (CANs) after the 2010 Haitian earthquake. CANs are characterized by seven unique features: (1) size; they are large with hundreds, to tens of thousands, of individuals; (2) geographical coverage; covering the entirety of a country; (3) a horizontal structure without pronounced hierarchies and chains of command; (4) being part of, and embedded in the local population (5) trusted by locals; (6) motivated volunteers; and (7) possession of detailed knowledge of local conditions (Holguin-Veras et al, 2012a).

CANs are also defined as a completely local effort that exist (typically, for another purpose) and cannot be replicated by agencies with foreign components (Holguin-Veras et al, 2012a). In order to more clearly establish this notion it is important to note, that unlike faith-based organisations (FBOs) and community-based organisations (CBOs), CANs are not non-profit organisations or non-governmental organisations (NGOs). There is however a slight overlap between FBOs and CANs. This is due to the sweeping definition of FBOs which includes organisations which may operate at a national or international level with particular mandates and established projects and programmes, and simply religious congregations and their places of worship (Castelli and McCarthy, 1997). Whilst the former does not constitute a CAN due to a lack of social embeddedness and a set of predetermined objectives, the latter does as it is inclusive of societies which may mobilises within their communities, for their communities; often in order to meet a particular disaster or development need.

As a result of these characteristics, CANs have proven to be more efficient at delivering critical supplies and in setting up Points-of-Distribution compared to external organisations after the 2010 Haitian earthquake. Many of the problems faced by external organisations related to the “lack of connectivity with the local logistic networks that possess the knowhow, manpower, and assets to deliver supplies to the disaster area” (Holguin-Veras et al., 2012b: p. 1637).

Similarly, in the aftermath of the 2011 Great East Japanese Earthquake (GEJE), social networks in local communities promoted recovery of the regional population (Yasuyuki et al, 2014). Although this research recognizes that large-scale disasters or catastrophes inhibit a community’s capacity to respond, or their capacity to contribute to disaster management (Holguin-Veras et.al, 2012a; UNISDR, 2009), it also suggests that community capacity is not entirely destroyed and is a valuable asset.

Furthermore, moving away from the focus on HOs and traditional HL helps to shift the paradigm towards collective solutions, intersectoral contacts, trust, democratic space and social diversity (Uvin et al., 2000). Additionally, it helps to question the notions surrounding the influence of humanitarian operations. It has been suggested that the size of an organisation, or even the number of beneficiaries reached, does not necessarily determine the actual impact of a humanitarian operation on a society (Handy et al., 2006). In light of this, this article will shift the focus from the ‘beneficiary’, to the role of communities as competent actors in their own relief and development and will address the following research questions:

RQ1. What evidence is there of CANs involvement in humanitarian operations?

RQ2. What activities do CANs undertake during humanitarian operations?

RQ3. What is the impact of CAN involvement on humanitarian operations?

3. Methodology

A systematic review was deemed appropriate to achieve the aim of the research. It employs a scientific approach which enables the researchers to conduct a detailed article search whilst mitigating bias, promoting transparency and ensuring relevance (Denyer and Tranfield, 2009; Leseure et al., 2004). Systematic reviews can also facilitate the expansion of the knowledge base and help to inform policy and practice (Tranfield et al., 2003). This research includes (i) planning, (ii) searching, (iii) screening and (iv) reporting (Tranfield et al., 2003).

We began an extensive scoping exercise in order to identify key themes, trends and gaps emerging from HL literature. This process guided the selection of key search terms to be used in the systematic review. From these exercises it was noted that there was a substantial lack of beneficiary or community perspective in relation to disaster management and that most inclusion of grassroots data was driven by NGO-centric programmes.

The literature associated with community involvement or participation in HL or disaster management activities was explored extensively during 2014 and 2015. Table 1 details a comprehensive list of keyword searches whilst Table 2 depicts the databases searched and the results retrieved.

Table 1. Keyword Search

	AND		
	Humanitarian Logistics	OR	
		A. Humanitarian Disaster	B. Collaborative Aid Network
OR	Humanitarian Supply Chain*; Humanit* supply*; Humanit* Logistic*	Disaster*; Humanitarian Crisis; Humanitarian Operation; Respon* Relief*; Recov*; Prep*; Mitigat*; Communit* Resilience; Communit* Vulnerabilit*	Communit*; Community Based; Community Based Orgnai?ation*; Civil Societ*
	*: any string of characters. ?: any single character		

Table 2. Databases Searched (from 12th December 2014 until 12th January 2015)

Database	Number of Publications
ABI Inform	227
Science Direct	191
Emerald	294
EBSCO HOST	37
Google Scholar	132
Total	881
*Scope: Title, Abstract & Keywords	

In order to ensure the relevance of the papers and the reliability of the results, an inclusion and exclusion criteria were developed; a full list of which can be found in Appendix A. In addition to guiding the research, these criteria also support rigorous and defensible data (Meline, 2006).

We identified 881 articles which matched our keyword searches. Although the number is relatively small, this was expected due to the novelty of the topic and its relative lack of maturity as a subject.

The exclusion criteria detailed for this research were strictly adhered to. This is important to note as although some papers raised by our keyword searches may have focused on community involvement in disaster operations, we were acutely aware of the need to only highlight internally orchestrated community action. If papers detailed externally managed processes or initiatives run by HOs, they were excluded from this study. This may help to account for the high exclusion rates and small body of literature. At this juncture it is also important to note that of the papers returned by the search, 53 could not be analysed due to access constraints. Due to the sensitive nature of this research and its relative infancy, some of these articles were made up of grey literature, despite the inclusion criteria stating that only peer-reviewed literature would be considered. In addition, despite this research having access to three University libraries and the British Library, some articles were still not available for

review. Whilst this is recognised to be a limitation of this study, it is arguable that the number of inaccessible papers poses no threat to the robustness of this research.

Additional research strategies were employed due to the range of keywords which often denote similar concepts. As a result, overarching themes relating to this research are lacking; a trait synonymous with novel research. The additional search strategies therefore employed to address this issue included manual searches of reference lists included within the study, and consultation with experts within the field at various international conferences. In some cases authors of key papers were also contacted to gain additional insights.

Figure 2 depicts a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram in which the systematic process can be observed. The results of this method enabled us to explore a developing literature in order to identify practical demonstrations of CAN involvement in HL.

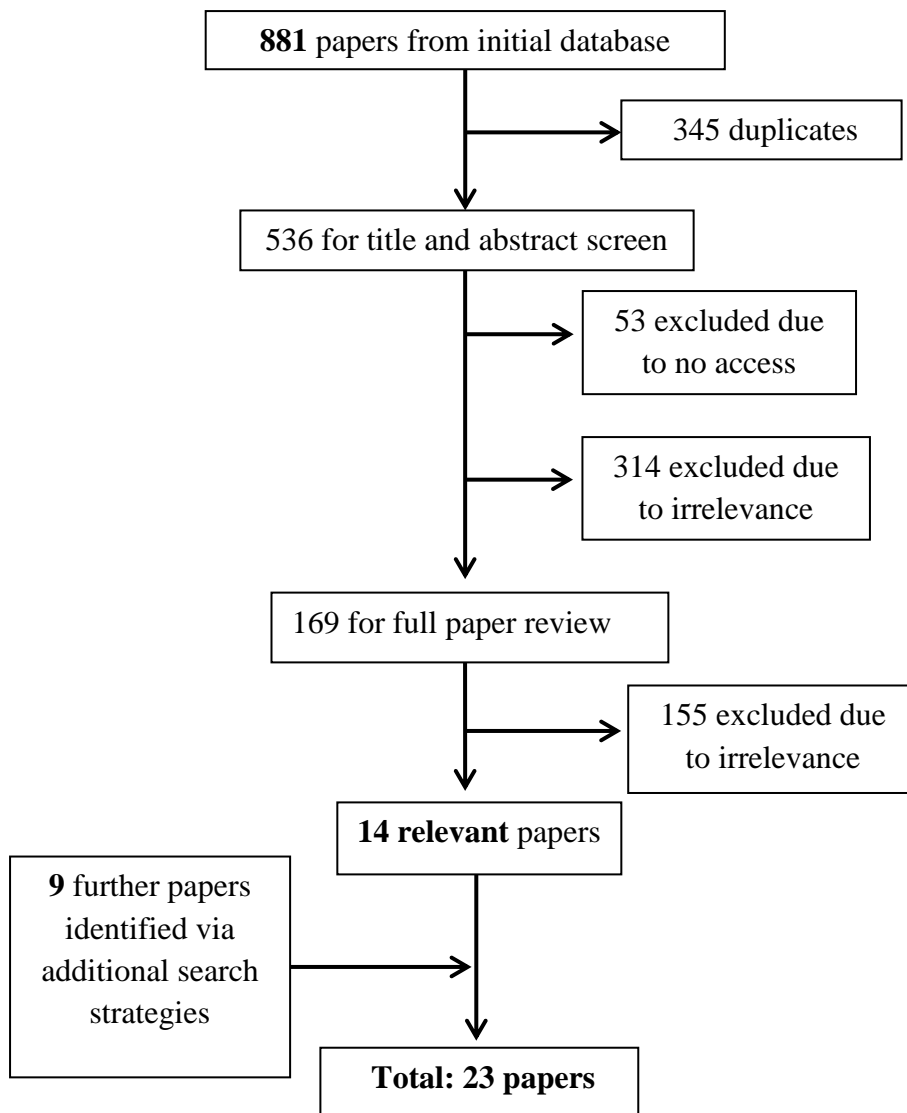


Figure 2. PRISMA Flow Diagram

4. Systematic Review Findings

Since 2006 eight literature reviews have been published on the topic of HL (Kunz and Reiner, 2012; Leiras et al., 2014). Whilst Kovács and Spens (2007) classify HL, Altay and Green (2006) published a review of disaster operations but only in the field of operation research, therefore limiting their scope (Kunz and Reiner, 2012). Overstreet et al (2011) also examine

HL but exclude slow onset disasters, whilst Natarajarathinam et al (2009) have focused on supply chain management during crises (Kunz and Reiner, 2012). Petit and Beresford (2009) discuss critical success factors in commercial logistics and apply this to a humanitarian setting, and finally Leiras et al (2014) create a theoretical framework to analyse the factors impacting HL. Although some of the key literature uncovered by this paper has been identified in these articles (Holguin-Veras et al., 2012a; Kovács et al., 2010; McLachlin, 2009; Perry, 2007), none of these reviews have identified a need to address independent community capacity in all disaster phases.

Figure 3 presents the number of articles discovered during the systematic review which relate to community-driven HL, and the years in which they were published. The gradual rise after 2004 may be due to the impacts of the 2004 Tsunami as the importance of HL became acknowledged after this catastrophe (Thomas and Kopczak, 2005; van Wassenhove, 2006). The lull in papers during 2011 and the following sharp rise in 2012 may be the result of the impacts of the 2010 Haitian Earthquake.

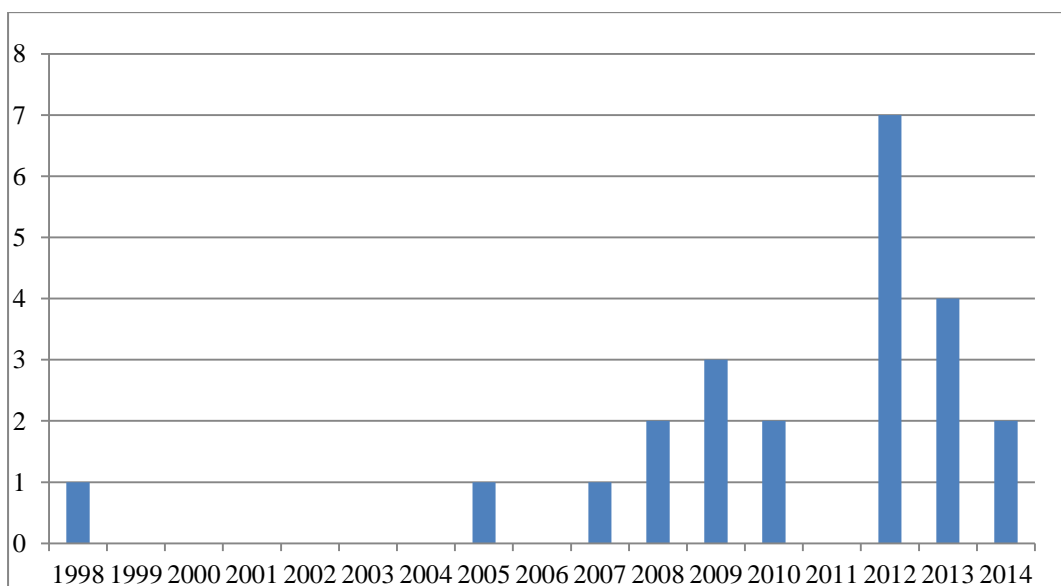


Figure 3. Number of published papers concerning community-driven HL

This research clearly revealed that community-driven HL has enabled disaster affected populations to proficiently undertake specific logistical activities. Interestingly, this research also identified that the involvement of CANs in humanitarian operations had subsequent effects on social issues. Table 3 summarizes the findings from the literature review and categorizes each paper in relation to the activities communities undertook, and in which disaster phases.

We discovered that the literature associated with community-driven supply chains addressed two key themes. The first is represented by logistics activities and relates to: local responders; reconstruction; procurement; transportation and distribution and information sharing. The next key theme addressed the impacts of CAN involvement on development and included: economic growth; trust; livelihood recovery; environmental rehabilitation and community empowerment and resilience. The disaster phases in which these activities and processes took place was also identified. These recurrent themes clearly demonstrate that CANs are capable of efficiently and effectively handling logistics activities post-disaster, and that such activities also present opportunities to tackle cross-cutting issues.

Table 3. Literature addressing community-driven disaster operations²

Articles	Community-Driven Logistics Activities					Development Activities					Disaster Phase			
	LR	REC	PRO	T&D	IS	LR	EG	T	CER	ER	Relief	Recovery	Mitigation	Preparation
Allen, 2013		x							x	x		x		
Birkmann et al., 2008						x			x	x		x	x	x
Bolin & Stanford, 1998		x			x			x	x		x	x		
Chang et al, 2010		x	x						x			x		
Chang et al., 2012		x	x						x			x		
Coles et al., 2012		x		x								x		
Costa et al, 2012				x	x						x			
Fois & Forino 2014		x	x		x		x	x	x	x		x	x	
Holguin-Veras et al., 2012a			x	x					x		x	x		
Holguin-Veras et al., 2012b				x	x			x			x			
Holguin-Veras et al., 2012c			x	x	x			x	x		x			
Holguin-Veras et al., 2012d				x					x		x	x		
Holguin-Veras et al., 2014	x			x	x				x		x			
Kovács et al., 2010		x					x					x		
Kubo et al., 2013	x	x		x	x			x	x		x	x		x
McLachlin et al., 2009			x	x	x			x			x	x		x

² Abbreviations pertaining to Table 3: Community- Driven Logistics Activities- Reconstruction (REC), Procurement (PRO), Transportation & Distribution (T&D), Information Sharing (IS); Development Activities- Livelihood Recovery (LR), Economic Growth (EG), Trust (T), Community Empowerment & Resilience (CER), Environmental Rehabilitation (ER).

McLaughlin, 2013	x	x	x	x	x		x	x	x		x	x		x
Montgomery, 2013				x					x	x		x		
Nigel, 2009						x								
Oloruntoba, 2005	x				x				x		x			x
Perry, 2007	x				x			x	x		x	x		x
Régnier et al., 2008		x				x	x			x		x	x	x
Stewart et al., 2009				x	x		x		x		x	x		

5. Community-Driven Humanitarian Logistics

5.1 Local Responders

Response to disasters often begins within the communities affected by it, who, despite experiencing an extreme situation, are in the best position to act immediately (Perry, 2007). In addition, they are increasingly being recognized as able to provide the first wave of aid after a disaster (Holguin-Veras et al., 2012a). Local responders are defined by this research as drivers of first phase relief efforts which are undertaken within the disaster affected community, by the disaster affected community. Although previous research has claimed a lack of local capacity in catastrophic events (Holguin-Veras et.al, 2012a; UNISDR, 2009), the complex situation post GEJE demonstrated rapid local responses despite the absence of huge external aid provision typically available after a disaster of this size (Holguin-Veras et al., 2014).

Many Buddhist temples became refugee centres with people arriving within 20 minutes of the quake (McLaughlin, 2013), whilst numerous religious groups collaborated to clear debris, deliver supplies and organize community gatherings (Kubo et al., 2013; McLaughlin, 2013). Christian organisations also housed refugees and one church served as the “launching point for volunteer projects organized by other Japan Baptist Union churches from across the country” (McLaughlin, 2013: p. 300). McLaughlin, (2013) also reports “large-scale Christian initiatives that coordinate multiple churches in comprehensive aid efforts” (McLaughlin, 2013: p. 300).

Despite these successes, there are still tensions between communities and external providers of aid. In 2003 Fiji was hit by Tropical Cyclone Ami. The Government received huge criticism for the way they handled the disaster affected population and the subsequent aid dependency that ensued. In order to try and mitigate this, the Government endeavoured to engage the public in disaster management (Méheux et al., 2010). One activity undertaken by

communities was initial needs assessments, however, “community participants were concerned that their independent assessment of damage would not be accepted and government decision-makers would not listen to the community” (Méheux et al., 2010: p. 1106).

Whilst there are clear examples which validate the collaborative and coordinative power of CANs, there is also evidence of poor cohesion between traditional providers of humanitarian assistance and the community; whether this is due to nominal appreciation of local capability and capacity, or a perceived lack of appreciation. Conversely, this research does highlight that disaster affected communities are able to provide instantaneous, locally-driven responses to relief, and are valuable stakeholders, with valuable resources (Oloruntoba, 2005; Perry, 2007).

5.2 Reconstruction and Procurement

The literature found that the processes of reconstruction and procurement were often interlinked when discussing community involvement in these activities; often CANs are able to mobilize resources and volunteers (Holguin-Veras et al., 2012b; McLaughlin 2013). Additionally, issues of trust, environmental rehabilitation and community resilience and empowerment were also linked with these processes.

Reconstruction was identified as activities related to demolition, construction, and the recycling and removal of debris from disaster sites (Coles et al., 2012; Montgomery, 2013). These processes were also synonymous with community-driven town planning (Allen, 2013; Fois and Fornio, 2014; Kubo et al., 2013) and direct involvement in the procurement and design of housing (Chang et al., 2012; Kovács et al., 2010). The literature also touches upon equity and trust issues (Allen, 2013; Bolin and Stanford, 1998; Fois and Fornio, 2014)

whereby CANs have taken ownership of disaster responses due to poor relationships with municipal bodies.

In the wake of the Northridge earthquake in 1994, trust between the population and HOs was lacking (Bolin and Stanford, 1998). Examples of community members refusing to seek assistance from HOs despite need, and eligibility, were documented (Bolin and Stanford, 1998); demonstrating the negative impacts of poor relationships. Strained relationships in Broadmoor after Hurricane Katrina led to CANs guiding recovery (Allen, 2013). Communities like Broadmoor were facing demolition of their homes, with the government intending to turn the area into parkland. Through the Broadmoor Improvement Association (BIA), the community designed and implemented their own town plan; in turn this leads to the reduction of power imbalances between state and community (Das Gupta et al., 2004). Similarly, after the GEJE, local residents and specialists, such as architects, were relied upon to create new neighbourhood plans and even assisted in the reconstruction of districts (Kubo et al., 2013). Interesting examples have also arisen in Europe whereby the Italian residents of L'Aquila self-built an ecovillage due to refusing to accept the housing and recovery solutions proposed by the government (Fois and Fornio, 2014). Instead the community developed an autonomous housing project which met their needs, maintained their identity and distanced them from government plans; whose motivations the community were very sceptical of (Fois and Fornio, 2014).

CANs are an important force in this regard as they help to keep organisations connected to the communities they serve. Régnier et al (2008) propose that disconnection from local communities can lead to well-funded projects being embroiled in “various malpractices, including client-patron relationships and corruption” (Régnier et al., 2008: p. 420). Similarly, Kovács et al (2010) argue that the needs of beneficiaries demand the reconstruction supply chain is also related directly to the reconstruction of livelihoods, and the resources which

enable the restoration of these livelihoods (Kovács et al, 2010). They also argue that due to the long-term nature of reconstruction there is no real need for HOs to act as proxies, as the communities are more than able to articulate their needs (Kovács et al, 2010). Additionally, a community-based approach to reconstruction ensures access to local suppliers and capacities, which in turn supports economic growth (Kovács et al, 2010).

To further demonstrate the relationship between reconstruction and procurement, Chang et al (2010) propose that an ‘owner-driven approach’ in which “house owners are responsible for rebuilding their own houses through self-maintenance with limited external financial, technical, and material assistance” (Chang et al., 2010: p. 251). This also supports an empowering and participatory approach to disaster reconstruction, indicating that communities are capable of undertaking reconstruction activities. Procurement is also greatly affected by community influence and participation. Chang et al (2012) argue that a lack of community involvement in reconstruction often leads to a lack of understanding of their needs by professionals. Research by Lyons (2009) also highlighted the importance of owner-driven reconstruction, arguing that such programmes allows “beneficiaries to become independent of gate keepers at an earlier stage” and helps them to “avoid being victims of corrupt procurement processes during construction” (Lyons, 2009: p. 396).

The adoption of local partnerships by NGOs and faith-based organisations (FBOs) has also proved incredibly successful in some key areas of disaster relief and recovery. Coles et al, (2012) discovered that although partnerships between local and international agencies were less stable than partnerships between international agencies, engaging in these relationships facilitated significant relief activities. 50% of food distribution and 30% of construction/demolition activities were facilitated by international NGO/FBO engaging in local agency partnerships. Interestingly, in the field of construction/demolition, international

NGO/FBO - international NGO/FBO partnerships were most common, but facilitated 25% of activities; a statistic similar to that of the NGO/FBO – local partnerships (Coles et al., 2012).

Alongside reconstruction, post disaster sites have also undergone environmental rehabilitation with a ‘Greening the Rubble’ programme undertaken in New Zealand after the 2011 Christchurch earthquake. This initiative involved volunteers responsible for transportation, maintenance and construction materials; removing debris and utilizing these spaces for the community (Montgomery, 2013). Although some spaces were only temporary, they reflected the needs and wishes of the community, demonstrating logistical capabilities, resource mobilization and community empowerment and ownership.

5.3 Transportation and Distribution

Post-disaster transportation and distribution is supported by the unique characteristics of CANs who have knowledge and ability to address these challenges. To demonstrate the capacity of Haitian logistics, it was estimated that pre-earthquake, between 16,000 and 20,000 metric tons per day were transported to Port au Prince by “a network of distribution centres, warehouses, truckers, restaurants, grocery stores, and street vendors; tens of thousands of individuals strong” (Holguin-Veras et al., 2012c: p. 7). Although the 2010 earthquake greatly impacted this capacity, it demonstrates the potential expertise, capabilities and proficiencies existent in a population. Similarly, after the GEJE, local truckers demonstrated effective distribution due to their fast access to local assets, and their knowledge regarding where these were needed the most (Holguin-Veras et al., 2012c; 2014). Local residents were also responsible for distributing food and water amongst affected communities (Kubo et al., 2013).

Due to these vast networks, Holguin-Veras et al concluded that attempting to create Points-of-Distribution networks from scratch would simply take too long to be effective. (Holguin-

Veras et al., 2012a; 2012b). This suggests that tapping into pre-existing CANs and their vast connections after a disaster is a much more practical solution than relying on NGOs to create them from nothing (Holguin-Veras et al., 2012a; 2012c). Careful planning relating to PODs is also vital in minimizing negative impacts on the community, relating to the distance which they may need to travel to receive assistance (Costa et al., 2012). By utilizing CAN resources such as established community centres, clubs and churches, Costa et al (2012) argue that improved performance in distribution can be achieved.

Finally, it was noted that some FBOs have extensive collaborative partnerships with various CANS which enables them to improve their performance (McLachlin et al., 2009). This FBO also had partners for transport, with most of their relationships culminating in support for distribution; “here they have many partners and collaborators, including in-country church groups, government agencies, the UN and similar agencies, local organisations, and other NGOs” (McLachlin et al., 2009: p. 1056). McLachlin et al (2009) conclude that this case highlights the importance of collaborative partnerships as disaster scenarios require such a disparate number of actors to be coordinated. They further this by suggesting that local partners who know the ‘lay of the land’ are integral to achieving humanitarian missions in disaster contexts.

5.4 Information Sharing

Information sharing and knowledge exchange have also been effectively undertaken by CANs; utilizing community groups with specific and unique understandings of the disaster context. Bolin and Stanford (1998) noted that community-based programmes “have generally used local knowledge and capabilities and been more flexible and sensitive to local conditions than standard technocratic federal disaster-assistance programmes are able to be” (p. 22).

The need to share information between local partners and other actors for the purpose of relevant and reliable needs assessments after a disaster is vital (Perry, 2007; Stewart et al, 2009). McLachlin et al (2009) reveal that the FBO at the focus of their study actively waits for an initial needs assessment to be carried out by a local organisation like a church or community group before they begin their humanitarian operation.

CANs also have detailed knowledge of needs and resources which is in part due to the fact they are embedded and trusted within their society (Das Gupta et al., 2004; Holguin-Veras et al., 2012b; 2012c). Examples of this can be seen after the Haitian Earthquake whereby 2.5 hours after the earthquake the leadership of the Dialogue in the Dominican Republic met in order to determine how they could assist. Upon connecting with other churches in Port-au-Prince and receiving information concerning needs on the ground, they determined that water, medicine, and tents were the most urgent needs (Holguin-Veras et al., 2012b). Not only does this demonstrate the rapidity of response of CANs, it also demonstrates efficient information sharing based on identified needs, and collaboration and coordination with relevant partners. Additionally, an information platform was established by Haitian community groups who joined forces to become the Plataforma de Ayuda a Haití, or Platform to Help Haiti/The Platform (Holguin-Veras et al., 2012b). The Platform “created a number of work groups, including: coordination (with local organisations in Haiti), bi-national advocacy, donations management, volunteer management, health, information and communications, fund raising, and infrastructure” (Holguin-Veras et al., 2012b: p. 1633).

The research also unearthed some examples in which CANs were not involved in disaster operations due to poor planning, which negatively impacted information and knowledge exchanges. After the GEJE, no plans were formed to address how the local population would be organized or who would lead local distribution of relief (Holguin-Veras et al., 2014). Kubo et al (2013) propose this is due to a lack of communication “between national and local

governments and citizens in Japan” (p. 16). As suggested by this research, utilizing CANs for these processes may have positively impacted this disaster response.

Although some research suggests the lack of CAN involvement in the GEJE was due to the overwhelming scale of the disaster (Holguin-Veras et al, 2012c). Research by McLaughlin (2013) and Kubo et al (2013) reveal a variety of disaster responses run by local people and various religious organisations in Japan after the GEJE. Some of these responses were incredibly fast with community members organizing neighbourhood patrols 25 minutes after the earthquake and a local disaster headquarters in a community centre within 45 minutes (Kubo et al., 2013).

Perry (2007) and Oloruntoba (2005) argue that collaboration in humanitarian operations should always involve parties from the local community as insufficient information provided about local capabilities can lead to inefficiencies (Oloruntoba, 2005; Perry, 2007). Perry argues that in the case of the 2004 Tsunami, it was the local people who undertook the initial rescue and relief work and that their work was vital. Despite this, Perry (2007) states that a “paternalistic attitude” was evident in some of the respondents, who viewed local culture as a hindrance to relief (p. 419).

Regardless of the negative attitudes towards CAN involvement in humanitarian operations, it is clear that local knowledge and information sharing can facilitate timeliness, and coordination and collaboration between countless actors. Not only do CANs have access to the population, they also possess vital information concerning the needs, culture, traditions and resources present within a community. Furthermore, they have a horizontal structure and collaborative nature which facilitates the effective sharing of resources and information.

6. Development Activities

The impact of involving CANs in humanitarian operations on development concerns is important to address as it supports understanding in relation to the wider affects community involvement has on disaster contexts. Birkmann et al's (2008) research on societal change, as the result of disaster impacts, suggests that communities and nations may in fact become more resilient. In addition, they argue that such impacts can pave the way for strategic policy making and adaptive livelihood adoption, thus mitigating the impacts of future disasters (Birkmann et al., 2008).

6.1 Livelihood Recovery and Economic Growth

Holguin-Veras et al's research in Haiti demonstrated that communities are able to quickly mobilize life and livelihood saving networks, which have the possibility of being extensive in their size and scope and are already established within the area (Holguin-Veras et al., 2012b; 2012c; 2012d; 2014). The literature also suggests that if local knowledge and capacities are used in humanitarian operations, communities can become more resilient; tailoring their needs to the demands of the context (Holguin-Veras et al., 2012a; Oloruntoba, 2005; Perry, 2007). Not only this, having a more resilient community will enable faster regeneration of the private logistics sector which, in turn, will support more efficient and effective disaster responses (Holguin-Veras et al., 2012a).

Utilizing local procurement and capacities will have a positive impact on the regional economy whilst ensuring "cultural and regional applicability of solutions and the potential to maintain local lifestyles" (Kovács et al., 2010: p. 419). Additionally, hiring local staff and using local materials and services will also contribute positively to the local economy (Kovács et al., 2010). CAN use of local resources also extended to capitalizing on their culture and practices. In Japan, local religious festivals were held in order to boost morale and attract visitors and vital tourist revenues (McLaughlin, 2013). What is more, some of the performances toured nationally in order to raise funds for the region (McLaughlin, 2013).

CANs have not only shown successes during relief, they have also been proficient in facilitating sustainable development initiatives which focus on long-term economic growth, livelihood stabilization and social development (Régnier et al., 2008). The involvement of the local population is advantageous due to the “direct knowledge of the situation and... direct stake in the outcome” (Das Gupta et al., 2004, p.28).

6.2 Community Empowerment, Resilience and Trust

The involvement of CANs provides a more holistic approach to HL and disaster management in general. Community empowerment, facilitated by this involvement, furthers the ability of disaster affected populations build resilience, which may even help to mitigate disasters in the future. Establishing meaningful relationships between communities and HOs will in turn lead to external forces having a better understanding of the local culture, and the systems which underpin it (McLachlin, 2009; Perry, 2007). Often, institutions neglect the potential benefits of local empowerment, participation, transparency, holistic long-term visions and sustainability (Fois and Fornio, 2014). The early development of respectful relationships built on trust is an important cultural consideration which may lead to long-term, reliable, collaborative partnerships between communities and HOs (Perry, 2007).

Such relationships may support empowering societies; for example, in Banda Aceh, after the 2004 tsunami, community influence enabled the redevelopment of homes to align with the needs and preferences of the community; here they requested modernized western homes which were seen to symbolize “solidity and social status” (Chang et al., 2012).

After Hurricane Katrina the BIA in Broadmoor became a grassroots power-house which leveraged more than \$48 million in outside investments (Allen, 2013), and those affected by the Northridge earthquake were able to assist those in the community either reluctant to

receive relief or unable to access it, through trust and vital connections within the society (Bolin and Stanford, 1998).

Even in communities perceived to have low levels of cooperation, as identified in Indonesia (Régnier et al., 2008), cooperative society can still be found at a religious level; in this case through Islam. Through Mosques, public interests could be expressed, both empowering the community voice and supporting collaboration, coordination and communication (Régnier et al., 2008). The GEJE even facilitated new instances of cooperation between religious institutions and Japanese citizens who had no previous religious affiliations (McLaughlin, 2013). It is suggested that these networks may in turn form the backbone of community resilience and enable the evaluation of, and adaptation to, post-disaster consequences (Stewart et al., 2009).

7. Disaster Phases

Relief and recovery efforts highlighted in the literature have been documented throughout this paper due to the vast bulk of articles concentrating on these phases. During relief, communities have distributed food and water, been vital to effective information sharing and have even supported evacuation and refugees (Holguin-Veras et al, 2012b; 2012c; Kubo et al., 2013; McLaughlin, 2013). Through recovery and reconstruction, CANs have supported procurement strategies for building projects, and aided in town planning (Chang et al., 2012; Kovács et al., 2010; Kubo et al., 2013).

Whilst mitigation aims to substantially lessen the impact of disasters through various strategies, preparedness aims to allow those involved to “effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions” (UNISDR, 2009). CANs have been identified as important entities which support mitigation practices as memberships of clubs and social action groups have been identified as a

“significant predictor of adaptation to hazard consequences” (Paton 2006: p. 313). Additionally it has been noted that communities play “an active role in identifying vulnerabilities to natural disasters, mitigating them and responding to them” (Takasaki, 2014: p. 1097).

Birkmann et al (2008) document mitigation practices in the form of reduction of vulnerability, and adoption of adaptive measures after the 2004 tsunami. Although some in the fishing communities still return to environmentally hazardous areas, others have established and maintained informal groups to address financial risk sharing (Birkmann et al., 2008). Although no easy task, Régnier et al (2008) document livelihood diversification in the fishery sector by a CAN called People Action for Development in India, in order to protect vulnerable fishing communities hit by the Tsunami (Régnier et al., 2008). Communities have also become active in raising awareness within their localities and have prepared evacuation plans (Birkmann et al., 2008).

In Japan, various CANs with religious affiliations mobilized an extensive disaster relief campaign, and also constructed escape measures along the shore in anticipation of future disasters (McLaughlin, 2013: p. 302); demonstrating efficient preparation and mitigation strategies. Most commonly, preparation activities included the prepositioning of supplies. McLachlin et al (2009) highlight how collaborative partnerships between HOs and CANs can facilitate effective preparation techniques as goods can be sourced from grains banks, farmers and church groups. Consequently, links with local school groups would enable these procured items to be efficiently assembled into relief supplies (McLachlin et al., 2009).

8. Discussion and Conclusions

This research proposes two-fold benefits of community-driven post-disaster operations. Firstly, the resources, capacity and local knowledge possessed by CANs significantly support

relief and recovery efforts. The collaborative nature of local networks enables improved dissemination of resources and information regarding needs. Additionally their capacity to share information enables more efficient and effective humanitarian operations; tailored specifically to the disaster affected community. Local knowledge and expertise has also ensured proficient distribution of goods and competent navigation of the terrain.

Secondly, this research has uncovered that CANs support a more inclusive approach to long-term recovery; a process which HOs often struggle with. The impacts on development for disaster affected societies, as a result of CAN involvement in humanitarian operations, may increase resilience and decrease vulnerability to future hazard events. By recognizing the power and influence of community-driven supply chains, and the positive impacts of community-led involvement in humanitarian operations, the effective communication of needs to a variety of stakeholders in the face of adversity can be facilitated (Stewart et al., 2009).

The findings from this research support the theory that the unique characteristics associated with community networks can empower CANs to tackle some of the most complex issues related to disaster contexts. It is also clear that even if a community has limited resources or has not formally been recognised by official institutions, independent, collective action which aims to utilise the resources available, can support communities to withstand the impacts of disasters (Fois and Fornio, 2014). This research also reveals that HL does not need to exist within a silo, and is capable of tackling cross-cutting issues in a more holistic fashion; taking into account both the importance of operational capacity post-disaster, and the wider development context needed to empower communities long-term.

Highlighting these collaborative partnerships draws attention to the vast wealth of knowledge and skills already in existence within a community, and the breadth of resources which could

be utilized through collaborative partnerships between CANs and the humanitarian community. This has the potential to impact policy and practice as CANs are well placed to provide fast, efficient and effective aid in a variety of disaster phases. Such impacts can be supported through case study research and resultant theory building from the findings and analysis. As a result, a theoretical model which details various factors relating to the interactions of CANs within the community and with HOs can be developed. CANs and traditional HL would benefit from the mutual exchange of best practices in order to optimize disaster response techniques and procedures. Increased partnerships may also help to mitigate the negative impacts of cultural challenges associated with humanitarian operations. Traditional HL operations may also be seen with increased trust and has having increased legitimacy, thus further improving performance.

The findings also reveal that CAN solutions are self-reliant, participatory and inclusive. The horizontal nature of operations has enabled communities to address unmet needs and has allowed for the finding of appropriate logistical and collective solutions based on realities faced at local level. The ownership of the process is inclusive of local expertise and therefore increases the acceptability and legitimacy of operations within the community.

Appendix A. Inclusion and Exclusion Criteria

Criterion	Rationale	Included	Excluded
Publication Type	Screening for publication type will ensure the credibility and reliability of sources.	Scholarly Journals; Conference proceedings with paper review; books	Editorials and Opinions Reports Conference proceedings; unless a full-paper peer review had taken place and was available Inaccessible papers
Peer Review	Peer reviewed documents are examined for quality and credibility are more likely to be used by practitioners and academics.	Peer reviewed	Non-peer reviewed; theses; practitioner documents
Quality of Journal	There is a paucity of information regarding this topic which is why lower impacting /ABS list ranked journals will be considered. Any journals with a high impact factor/ABS list ranking or above have been considered as they represent credible and peer reviewed papers.	Journals addressing: community involvement or participation in HL or supply chain activities after a disaster	Non- journal articles Non – scholarly journals Non- peer reviewed journals
Language	Papers written in English are only reviewed due to language limitations of author.	Papers written or translated into English	All other languages
Time Frame	No timeframe was specified as there is a paucity of HL literature and we wanted to capture as much data as possible in the searches.	N/A	N/A
Articles related to	Community involvement or participation in HL or supply chain activities after a disaster.	Examples of: community participation in all disaster phases, community based organisations, ad hoc network formation by communities	Articles out of the scope of this research: Commercial logistics and supply chains; HO-centric research i.e performance, optimization, external training; program or project delivery; war and conflict settings; healthcare; mathematical modelling

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