Humanitarian Activities against COVID-19 Disruption

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The COVID-19 pandemic has affected more than 214 countries across the world, disrupting the supply of essential commodities. As the pandemic has spread, humanitarian activities (HAs) have attempted to manage the various situation but appear ineffective due to lack of collaboration and information sharing, inability to respond towards disruption, etc. Developing a sustainable humanitarian supply chain (HSC) for managing disasters/emergencies can be viewed as an extension of the traditional supply chain. Thus, sustainable HSCs have evolved as a specialized discipline with a focus on social sustainability.

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1. Introduction

Natural disasters such as earthquakes, tornados, wildfires, floods, etc., inevitably disrupt supply chains regionally or globally [1]. The disruptions are seen in any form: it could be the shortage of materials, a temporary peak in demand of essential items that stimulates fear of resource scarcity, an uncontrollable environment, or many other such undesirable events. Humanitarian supply chains (HSCs) appear to hastily manage such disruptions and uncertainties [2][3]. However, developing an HSC is often more complex when compared to the general commercial supply chain [4]. The disruption caused by the virus outbreaks such as coronavirus (2019-nCoV) in China, the Zika virus, avian influenza A (H7N9), and Ebola virus (Zaire strain) in West Africa created a threat to human health and safety that questions the readiness/preparedness of any organization in meeting such emergency. The rise of the supply of ‘essential items’ (items of daily needs) and medical equipment (personal protection equipment, surgical masks, and ventilators) faces unprecedented demand for a much higher volume in comparison to the pre-COVID-19 situation [5][6]. The imbalance of demand and supply and the threat to human lives warrants humanitarian activities that offer long-term and short-term aid to the affected population. Humanitarian activities (HAs) are defined as the humanitarian emergency support offered to rescue any vulnerable individual or a group of individuals in a community by a collaborative effort of humanitarian organizations and their stakeholders. In an emergency, organizations need enhanced operational efficiencies and effective logistics services for vulnerable communities. These organizations, henceforth called humanitarian organizations (HOs), are required to be agile and adaptive to manage the emergency [7][8]. The role of digital technologies, including blockchain, in humanitarian activities is highly significant during a time of emergency [9][10]. BT are useful in the designing and development of the digital humanitarian network. Thus, the BT-enabled DHNs can bring more clarity and accessibility to actors and

flawless movement of disaster aids and information across the supply chains [11][12][13]. Humanitarian aid usually has a linear flow of supplies to the affected areas, especially to regions where the need is higher [14]. During COVID-19, the commercial supply chains deliver the needed supplies. However, humanitarian aids require a vast network and resource prediction until it is needed [15][16][17][18]. This acts as a limiting factor for HOs as multiple stakeholders are present in the supply chain. The development of humanitarian strategies and continuous assessment of humanitarian abilities of the cross-sector partners is important for sourcing essentials and strategic supplies [19][20]. The supply chain disruptions can be mitigated using a few operational strategies, including maintaining safety stock or exclusive supplies of healthcare products such as masks, hand sanitizers, protective gear, and ventilators from alternative sources through mobilization of resources [21]. Based on experiences from the past, humanitarian activities should include initiating the action plan and its implementation in cost-effective ways to ensure the flow of goods and services to a vulnerable group of people [22][23]. Therefore, creating a responsive portfolio of customized humanitarian services has become a major concern and topic of discussion by global disaster planners, humanitarian partners, researchers, and practitioners, including the World Health Organization (WHO). Since the 1990s, the WHO has highlighted the need for sustainable partnerships among various stakeholders (including governments, researchers, nonprofit organizations, private firms, and R&D entities), contributing to a variety of HAs in response to disaster mitigation [24][25]. The COVID-19 pandemic is considered the worst crisis since the Second World War [26][27]. As defined by the International Federation of Red Cross and Red Crescent Societies, COVID-19 is categorized as a natural hazard [28]. Disaster risk management has a relationship with the type of disaster, vulnerability, and exposure, as explained in this formula: risk= disaster*vulnerability*exposure [29][30]. For reducing risks, besides disaster prevention, it is required to plan and reduce vulnerability and exposure. Thus, the operational effectiveness in the pandemic situation cannot be seen as a whole; it needs to be broken down into meaningful and efficient sub-systems to measure its effectiveness [31][32][33].

2. Humanitarian Activities (HAs) in Enhancing Operational Effectiveness during the Pandemic

Developing a sustainable humanitarian supply chain (HSC) for managing disasters/emergencies can be viewed as an extension of the traditional supply chain [34][35]. Thus, sustainable HSCs have evolved as a specialized discipline with a focus on social sustainability [36][37]. Various parties (including NGOs, local and regional relief organizations, government agencies, HOs, and beneficiaries) and other stakeholders from the corporate sector comprise a centralized or a decentralized HSC structure [38][39] that aims to relieve the masses at risk. Otherwise, a single actor individually may not have sufficient resources to respond effectively to major disasters, including COVID-19 [40][41][42]. HAs play a critical role in a disaster. Coordination among humanitarian parties/actors can strengthen and enhance the outcomes through resource and information sharing, decision-making, and conducting joint-field surveys or cluster-based services towards social needs [43][44][45]. **Figure 1** illustrates the conceptual framework on critical factors of HAs influencing operational effectiveness of HOs. These HAs improved resilience through vertical and horizontal coordination among the actors [46][47][48][49]. In the light of blockchain technology, the effectiveness of HSC results in a smooth flow of suppliers, information, and resources to the beneficiaries and can be measured in

terms of response time by using the common elements of supply chain philosophy: “delivery of the right goods, at the right time, to the right place, and to the right set of people” [50]. Thus, a blockchain-driven HSC can be simply defined as a traceable system available to all stakeholders of HSC for effective roles and responsibility of the disaster migration and effective humanitarian activities [51][52][53].

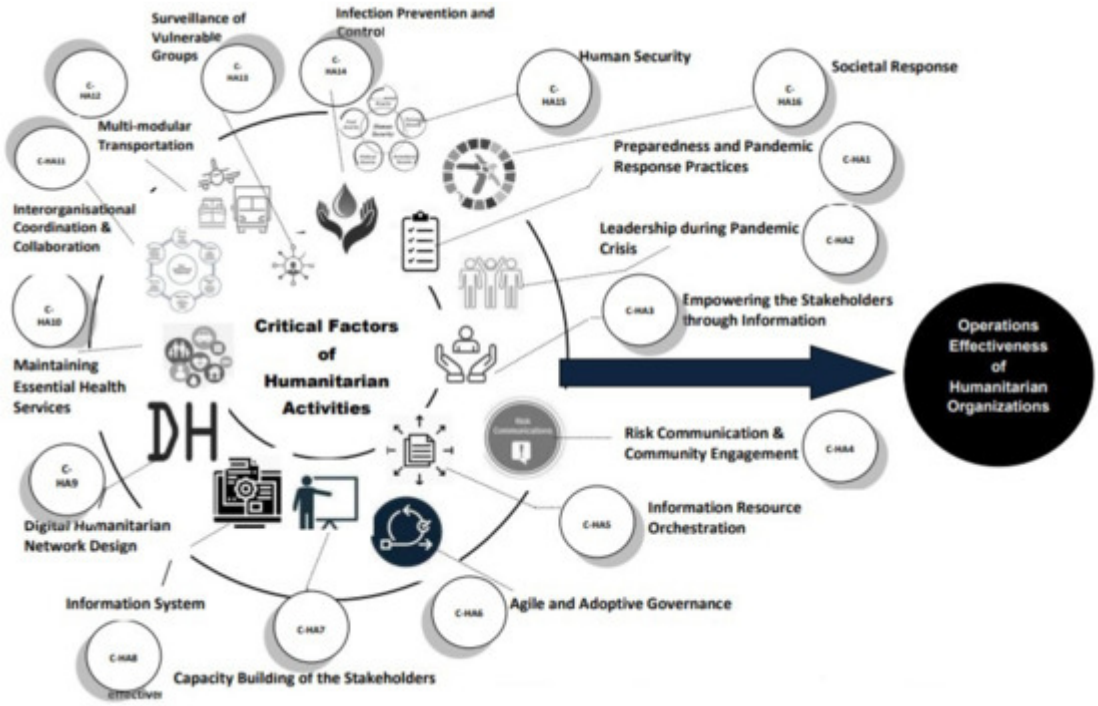

Figure 1. Conceptual framework of critical factors of humanitarian activities influencing humanitarian operations (Source: Authors).

The HAs also result in the development of local and regional infrastructure. Hence, a successful HSC management through HAs thrives to achieve a supply of “essential items” and help in mass evacuation of the community affected by disaster [54][55] through a process of cost-effective flow and storage of goods and materials from the point of origin to the point of consumption for the purpose of meeting the end beneficiary’s requirements [56][57][58]. A typical design of an HSC should be able to manage the available resources efficiently and enable the community to make the right decision by involving local authority through decentralized decision making [59][60]. Usage of technology can help HOs to plan capacity, engage resources, and improve demand prediction. The performance of HSC can be measured by its delivery performance (time, coverage, supply chain responsiveness, and cost involved) [61][62][63]. The COVID-19 is a global outbreak that leads to a sharp and radical shortage of essential supplies (i.e., PPEs, ventilators, protection masks, sanitizers, and hydroxychloroquine) [64][65][66]. The HSC partners mean to mitigate the global COVID-19 pandemic situation and to ensure critical supplies to aid recipients. An HSC ensures ‘line of sight’ along with COVID-19 mitigation, prioritized within the wider set of Has [67][68].

With the increasing pressure due to the loss of human lives, it is necessary to conduct a study that aims to determine the critical factors of Has [69][70]. Multiple stakeholders (parties including the government and private sector) strategically coordinate with each other to perform varieties of HAs to aid recipients [71][72]. Thus, a strategic

tie-up has a positive influence on the performance of HSC and increases its sharing capabilities [73][74][75]. Past literature stressed the feedback mechanism among the stakeholders in a HSCs system for developing a reference model [76][77][78][79]. The coordination among humanitarian actors can be increased by cost-effective usage of resources and the involvement of top-level managers in distribution roles [80][81]. Regular interactions between humanitarian actors are essential for the effectiveness of HAs. Effective communication measures to reduce pressure among supply chain actors and optimize the supply of essentials. Usage of ICT ensures the transparency and flawless exchange of information across the HSCs. Additionally, it increases the flexibility, agility, and alignment in emergency decisions. The commitment of humanitarian actors supports the aims of HOs in developing mutual consent towards operational decisions [82]. Effective training of the actors about a pandemic situation helps build capacity to respond more effectively during various disaster situations [83][84][85]. Various critical success factors are elaborated in **Table 1**.

Table 1. Critical success factors to enhance operational effectiveness of humanitarian activities.

Critical Factors	Operational Effectiveness during the Pandemic	References
Multi-modal transportation (C-HA1)	Usage of multi-modal transportation can connect all supply nodes, affected areas, and logistics operational areas.	[54]
Leadership during pandemic crisis (C-HA2)	Communicating with teams, stakeholders, and communities during COVID-19 enhances transparency, demonstrates vulnerability, and builds resilience among humanitarian organizations.	[56]
Empowering the stakeholders (C-HA3)	Empowerment of the stakeholders helps the humanitarian organizations to identify clear vision, competency, and coordination across all levels.	[29][38]
Risk communication and community engagement (C-HA4)	Risk communication across stakeholders brings transparency and pro-activeness towards the pandemic situation.	[56]
Information resource orchestration (C-HA5)	Adoption of information resource activities and information behavior activities can meet the need of humanitarian operations.	[49][64]
Agile and adaptive governance (C-HA6)	Participation collaboration and governance become more agile and adaptive during the pandemic.	[60][61]
Information system (C-HA7)	Information system planning should address challenges, value generation processes, and resource base in an effort to improve organizational performance	[63][65][86][87]
Capacity building of stakeholders (C-HA8)	A competency-based teaching approach can improve the intercultural pandemic training among the stakeholders who can further improve interdisciplinary integration, enhancing the overall operational effectiveness.	[57]

Critical Factors	Operational Effectiveness during the Pandemic	References
Blockchain-enabled digital humanitarian network (BT-DHN) (C-HA9)	Blockchain-enabled digital humanitarian network (BT-DHN) ensures participative management and real-time information flow that uses big data for the humanitarian response for effective relief operations.	[2][4]
Maintaining essential health services (C-HA10)	Adjust governance and coordination mechanisms to support timely action for essential health services and adapt to changing contexts and needs.	[20][26][52]
Inter-organizational coordination and collaboration (C-HA11)	Collaborative planning for responding the pandemic (through cooperation, interaction, and collaboration among relief agencies).	[29][38]
Preparedness and pandemic response practices (C-HA12)	Preparedness planning and COVID-19 response practices emerged as the key humanitarian activity among humanitarian actors.	[42][46]
Surveillance for vulnerable groups (C-HA13)	It aims to limit the spread of the pandemic in vulnerable groups (children, women, and the old-age population) by rapid detection, isolation, testing, and management.	[88][89]
Prevention and control (C-HA14)	Infection prevention and control (IPC) is the key humanitarian activity. IPC occupies a unique position in the field of patient safety and quality universal health coverage.	[3]
Human security (C-HA15)	It is protecting human life, especially the vulnerable groups, by involving local government and partners to increase operational effectiveness.	[39]
Societal response (C-HA16)	It is the collective efforts of humanitarian organizations, the corporate world, government, and the community to fight collectively against the pandemic. Based on the principle of 'Respond, Recover and Rebuild', the societal response to the COVID-19 pandemic is a continuous improvement process.	[39][40]

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