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Exploratory analyses of relief and development operations using social networks

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ABSTRACT

We use social networks to explore how structural factors affect humanitarian organizations' performance in relief and development operations. Analyses of two recent humanitarian disasters show that having pre-established partnerships among implementers, a central coordinator, high connectivity, and few structural holes facilitates coordination and improves performance. Similarly, cost efficiency analyses of 757 development programs reveal that (i) high performance of donors and beneficiaries is positively related to the amount of implementers they interact with, and (ii) programs connected by common actors are more cost efficient. Finally, short path lengths and frequent connections among actors or programs improve performance in humanitarian operations.

1. Introduction

Natural and man-made disasters have increased in frequency and impact during the last few decades [46]. In the last 10 years, the world has faced large disasters such as the Nepal earthquake (2015), typhoon Haiyan (2013), the Haiti earthquake (2010), hurricane Katrina (2005), and many other disasters requiring humanitarian aid. According to the International Disaster Database [32] of the Centre for Research on the Epidemiology of Disasters (CRED), "there were 6637 natural disasters between 1974 and 2003 worldwide, with more than 5.1 billion affected people, more than 182 million homeless, more than 2 million deaths, and with a reported damage of 1.38 trillion USD" [33,46,83]. Unfortunately, the future does not look much better: forecasts indicate a five-fold increase in disasters and a rise in their severity in the next 50 years [84]. The rise in the number of disasters has placed significant pressure on humanitarian organizations to meet the increased humanitarian needs. Consequently, humanitarian organizations, donors, and communities have been working together to develop more robust humanitarian operations to alleviate suffering and reduce human loss [78].

To manage these humanitarian operations, organizations have pursued timely and appropriate provision of the right goods, at the right place, and at the right time to the right people [23,78]. However, proper provision of goods is not an easy task for any humanitarian organization. On the one hand, organizations operate in challenging environments, facing difficult access and insecurity; still, they are required to achieve high performance while maintaining a high level of accountability [16,41,80]. On the other hand, the large number of actors, time pressures, and uncertainties in the system make it very difficult for organizations to coordinate [29,38,48,59,85]. Difficulties in managing the limited resources and coordinating with other organizations create inefficiencies and duplications in the system, leading to low performance and, consequently, to decreased future donations [91].

Traditionally, organizations adopt both hard and soft measures to evaluate operational performance. Hard measures refer to objective concepts such as net income, order cycle time, and costs; in contrast, soft measures refer to managerial perceptions on variables such as customer satisfaction, logistical efficiency, and productivity [15,24,36]. Humanitarian organizations responding to humanitarian needs typically work on three distinct types of programs: relief, recovery, and development. Relief programs are short-term activities addressing the immediate damages caused by disasters. Recovery programs address the post-emergency needs of an afflicted population [7,78]. Development programs aim to

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improve the medium- to long-term self-sufficiency and sustainability of life [7].

The implementation of these programs involves interaction among different actors, such as donors, implementers, and beneficiaries. Donors financially support the programs and set requirements to the implementers. Implementers are humanitarian organizations carrying out any type of program. Implementers compete among themselves for funds made available from donors. Finally, beneficiaries receive goods or services from implementers or, in some cases, directly from donors.

This paper moves away from single-phase and single-organization studies of humanitarian operations [57] to examine how partnerships and interactions among different humanitarian actors may affect the quality of a humanitarian response. In the first study, we focus on emergency and disaster relief activities, analyzing how multiple implementers interact among themselves to respond to the large-scale emergencies caused by rapid-onset disasters. In the second study, we focus on development programs, analyzing how the interactions among donors, implementers, and beneficiaries may support community self-sufficiency and sustainability. We use a social networks approach to study the emerging structures produced by interconnected organizations both in relief and development operations [51]. A network consists of nodes (e.g., organizations, programs) and ties (e.g., relationships, partnerships) that connect the nodes [45,58,67]. Although the social networks approach, which has its foundation in graph theory [52], has been widely used to study communities, communication flow, social structures and node performance [8,39,81], it has not been systematically used to characterize and understand humanitarian operations structures and their potential to influence information flow, coordination, and the performance of humanitarian organizations.

The paper proceeds as follows. In Section 2, we provide a brief literature review. Section 3 presents a first network analysis focused on relief operations. We study two of the most recent and large-scale natural disasters (i.e., the Haiti earthquake and typhoon Haiyan in the Philippines) to understand the kinds of interactions and partnerships among implementers and their potential effect on the perceived performance of the response. Section 4 illustrates a second network analysis of development programs. We analyze the interactions among donors, implementers and beneficiaries within different development programs and their effect on program performance (cost efficiency). Finally, Section 5 provides final conclusions and ideas for further research.

2. Literature review

Performance measurement is a process of quantifying the effectiveness and efficiency of action [68]. Effectiveness is the extent to which an organization does the right things, that is, the organizational ability to achieve pre-defined goals [36]. Efficiency is related to the capacity of the organization to do the things right to ensure the desired level of stakeholder satisfaction. In terms of resources, efficiency refers to "how well the resources expended are utilized" [36]. Performance measurement, both as effectiveness and efficiency of action, has gained importance in the humanitarian sector. For instance, for emergency supply chains, it is not only critical to secure accountability and improve program success [6] but also to evaluate the contribution of partnerships to performance [10].

Despite its importance in different operations, performance measures are not completely developed and implemented in the humanitarian sector, due to the particularities of the sector and the unique characteristics of each program [49,63,91]. In fact, one of the distinctive characteristics of nonprofit organizations is the ambiguity of performance criteria [71]. Therefore, in order to appraise the performance of nonprofits, it is necessary to consider the correct choice between soft and hard measurements, aiming to capture the organization's ability to respond to a changing environment and how effectively and efficiently the organization meets the needs of the stakeholders [50,78].

The ability of humanitarian actors to be well connected and to coordinate among themselves may be critical to achieve good performance [14,74]. However, coordination during humanitarian operations is challenging due to the interaction of a high number and diversity of actors [2,33,60]. Coordination can also be difficult due to the lack of incentives for organizations to work together, given complexities such as: (i) limited information sharing and communication between and within humanitarian organizations [72], (ii) urgency of humanitarian relief response in an uncertain environment, with limited time and scarce resources [29], (iii) limited and earmarked funds, and (iv) fierce competition for media attention and funding [2]. The tendency of organizations to focus on their own benefits and not rely on external partners, preferring to avoid the risk while gaining access to new resources by themselves, leads to a clear duplication of efforts and to a lack of information and resource sharing [59], which can be further seen as low organizational performance.

Concerns about the performance of humanitarian organizations have increased over the past 20 years [30,87], shifting the attention to the creation of better coordination and accountability frameworks. Initiatives created to face the incessant coordination issues have been grouped based on operational, tactical, and strategic dimensions [55,73]. Based on these dimensions, different UN agencies, major organizations, and NGOs have established different committees, offices, partnerships, and clusters to improve humanitarian coordination [2,56]. For instance, the Office of the UN Disaster Relief Coordinator (UNDRO), the Office of the Coordinator for Humanitarian Affairs (OCHA), and the Emergency Capacity Building (ECB) project have developed ethical, trust-based frameworks as key drivers of coordination and provided accessible systems to share information on the significant inhibitors of humanitarian operations. These kinds of partnerships seek to involve different actors at the global and local levels to ensure an adequate performance of the humanitarian response [22,35]. In this way, organizations have been trying not only to show that they can provide effective policies and services but also that they can interact with different humanitarian actors and deal properly with the uncertainties to carry out programs [78].

Similarly, scholars suggest that effective communication and integration of effort lead to a better diffusion of knowledge, ensuring an increase in program performance [21,42]. At a practical level, improving communication among actors may be achieved through collaboration initiatives [67] or through jointly agreed-upon performance measures and metrics [40]. Therefore, given the need for rapid response in relief operations and the related complexities of measuring organization and response performance [49,63,91], effective partnerships can lead to increased levels of communication and coordination. In addition, long-term development programs may benefit from performance measures in two ways: assuring donors that the organization uses the funds properly [34] and increasing the level of agreement among actors in a program [25].

The ideas above suggest that improving the communication or flow of information among the different actors in a relief or development program can also enhance their coordination and performance. Thus, to ensure enhanced coordination and performance, it is imperative to understand the communication and flow of information among different actors, that is, the nature of interactions between different actors [37]. From a networks

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