

**Cross-Sector Social Interactions and Systemic Change in Disaster  
Response: A Qualitative Study**

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### **Abstract**

The United States National Preparedness System has evolved significantly in the recent past. These changes have affected the system structures and goals for disaster response. At the same time, actors such as private businesses have become increasingly involved in disaster efforts. In this paper, we begin to fill the gap in the cross-sector literature regarding interactions that have systemic impacts by investigating how the simultaneous processes of systemic change and intensifying cross-sector interaction worked and interacted in the context of the preparedness system. We examine these inter-linkages through a qualitative study in the setting of Hurricane Sandy. Drawing from systems theory, we develop a grounded model that provides an explanation for the system change and highlights how cross-sector interaction relates to the changes observed in the system.

*Keywords:* cross-sector social interaction; qualitative research; systemic change

## Introduction

Hurricane Sandy was the most devastating natural disaster to affect the USA in 2012 (Associated Press 2013). Not only was it one of the deadliest natural disasters ever to have hit northeastern USA, but it was also the second most expensive hurricane of modern times, surmounted previously only by Hurricane Katrina (Blake et al. 2012). Yet the disaster response and subsequent recovery were deemed relatively successful (Bucci et al. 2013), particularly in the state of New Jersey. In this paper, we examine the fundamental changes to and evolution of the US National Preparedness System (see Homeland Security 2011a), which has undergone a significant overhaul since the major disasters of 9/11 and Hurricane Katrina. This transformation process is unexpected and surprising, both in scope and speed, because of the complex structure of and the heavy government oversight of the system, which generally can make sustained innovation challenging (Senge et al. 2012). Our study examines the changes that have involved and taken place in parallel with the emergence and growing involvement of nontraditional partners, such as private businesses, in the disaster settings. Although these processes of systemic change and intensifying cross-sector social interaction (CSSI) hold promise for further improved response outcomes, their nature, inter-linkages, and implications have not yet been thoroughly studied.

While a growing academic debate has emerged on cross-sector partnering for purposes of doing social good (Waddock 1988), much of the attention has been on “lighter” forms of engagement and value creation, such as philanthropic, transactional, or (at best) integrative partnerships between nongovernmental organizations (NGOs) and businesses (see Austin and Seitanidi 2012a, b; Kourula and Laasonen 2010). Further, researchers have explored collaborative, competitive, or conflict-oriented interactions (Yaziji and Doh 2009; Austin 2014) involving a broader spectrum of actors (Bowen et al. 2010; De Bakker et al. 2013) or a larger number of participants (Clarke and Fuller 2010). Yet, significant gaps remain in the understanding of how cross-sector (multi-organizational) interactions may contribute to systemic or transformative change in macro systems (Selsky and Parker 2010; Austin and Seitanidi 2012a, b). So far, it has mainly been proposed by researchers that such impacts should be possible (Seitanidi and Lindgreen 2010; Austin and Seitanidi 2012a, b)—but only a few empirical studies have actually reported collaboration outcomes that can be considered to have transformative elements or potential (e.g., Bitzer and Glasbergen 2010; Seitanidi et al. 2010; Sakarya et al. 2012). There appears to be a critical need to extend existing knowledge by conducting additional empirical studies focusing specifically on cross-sector social partnering or interactions aiming at, or resulting in, transformative outcomes.

In this study, we begin to fill the gap of how the processes of CSSI and systemic change jointly work and interlink as part of a large-scale transformation process, by examining a major change process in one specific context: the US National Preparedness System. The main research question addressed in this study is: *How do CSSIs contribute to the systemic changes that are taking place in the preparedness system?* We study these dynamic processes in the empirical context of Hurricane Sandy in New Jersey through a qualitative grounded theory (GT) (Corbin and Strauss 2014; Glaser and Strauss 1967) approach. By addressing this research question, we especially seek to advance the understanding of how transformative change can come about and unfold as a result of CSSIs. In addition, our empirical study capitalizes on a unique opportunity to examine the inter-linkages between CSSI and systemic change in a multi-organizational, cross-sector network that belongs to a broader system orchestrated by government agencies, and which has shown a remarkable capacity for renewal and adaptation.

Our study contributes to research and theory in several ways. First, we begin to fill the gap in the CSSI literature (e.g., Seitanidi and Crane 2014) regarding interactions that impact the transformation of broader systems. Specifically, we examine how the preparedness system has evolved from a (federal) government-centric structure, in which emergency responders played the central roles in disaster preparedness and governance, into a system where the “whole community” is placed at center stage. Our analysis shows that the preparedness system itself is essentially a constellation of actors as well as (formal and informal) cross-sector and within-sector interactions. Second, integrating systems theory-related concepts (e.g., von Bertalanffy 1972; Senge et al. 2012) into our analysis and theory,<sup>1</sup> we contend that the system is expanding and transforming as part of a long-term process. Third, we provide a theoretical model that provides an explanation for the system transformation that occurred in the aftermath of Hurricane Sandy and highlights how CSSIs contributed to this change. Overall, we contend that a long-term, evolutionary change process is taking place in the system, where the successes and failures of responding to real-world disasters have served as catalysts for further system refinements. Taken together, our findings introduce a new perspective to the cross-sector literature, which so far has mainly expected transformational impacts to result from (formalized) cross-sector partnerships with transformative aims. We hope that our study can help redirect a part of future inquiry to this intriguing new direction.

This paper is structured as follows. We first review cross-sector (social) interactions literature and then outline the theoretical background to the study. Then, we describe the employed qualitative GT methodology (Corbin and Strauss 2014) and the research context. Last, we present the findings, discuss their implications, and offer our concluding thoughts.

## **Review of the Cross-Sector Literature**

Consistent with the Straussian grounded theory (Corbin and Strauss 2014) approach, we initially conducted a review of the CSSI literature to confirm a research gap and to provide direction to our empirical study (see Denk et al. 2012). The literature we reviewed spans multiple fields, including business ethics (BE) (Vurro et al. 2010; Rueede and Kreutzer 2015), management (Berger et al. 2004), international business (Ritvala et al. 2014), supply chain management (SCM) (McLachlin and Larson 2011; Day et al. 2012), and nonprofit (Austin 2000) and public administrations (Simo and Bies 2007). In this section, we first discuss different types of cross-sector (social) interactions and then focus on transformational cross-sector partnerships.

### **Cross-Sector Social Interactions**

The debates on cross-sector interactions and social partnerships started decades ago. Waddock (1988, p. 18) defines a social partnership as: “a commitment by a corporation or group of corporations to work with an organization from a different economic sector (public or nonprofit). It involves a commitment of resources—time and effort—by individuals from all partner organizations. These individuals work cooperatively to solve a problem that affects them all. The problem can be defined at least in part as a social issue; its solution will benefit

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<sup>1</sup> While we refer to systems theory already in the introduction and discuss the theory in detail in the theoretical background section, it is useful to note that the theory was not chosen as a theoretical frame for our grounded theory (GT) study before data collection. Instead, consistent with the GT approach, insights from systems theory were only integrated to the emerging grounded model as part of theory integration. Yet, similar to other scholars (e.g. Nag et al. 2007), we discuss the theory before data presentation for greater reader-friendliness.

all partners.” Consistent with this definition, the purpose of cross-sector *social* partnerships or interactions typically involves organizations jointly tackling “social issues” (Selsky and Parker 2005) or provisioning “public goods” (see Seitanidi and Lindgreen 2010), such as furthering (environmental) sustainability (Clarke and Fuller 2010), development (Manning and Roessler 2014), or social justice (Cornelius and Wallace 2010). Selsky and Parker (2005, p. 850) see cross-sector social partnerships as being (short-term or long-term) “cross-sector projects formed explicitly to address social issues and causes that actively engage the partners on an ongoing basis.” While the extant cross-sector literature lacks an established definition for cross-sector social interactions (CSSIs), the concept is clearly broader than (formal) partnerships as it incorporates informal (or non-formalized) engagements and interactions between organizations or individuals who may represent different sectors as well (Seitanidi and Lindgreen 2010; Kolk et al. 2010). While most partnerships could be expected to be—at least in principle—cooperative or collaborative by nature, different types of interactions can involve also conflict-oriented (Yaziji and Doh 2009), competitive (Austin 2014), or mixed relationship dynamics (Baur and Schmitz 2012; Laasonen et al. 2012).

In addition to research on collaborative business engagements with NGOs (Rivera-Santos and Rufin 2010) or public actors (Saz-Carranza and Longo 2012), the CSSI research stream has recently been extended to cover a broader range of interactions and partnerships (see Vurro et al. 2010). Selsky and Parker’s (2005, 2010) four-part categorization divides these into: (1) nonprofit–business; (2) government–business or public–private; (3) government–nonprofit; and (4) tri-sectoral partnerships. Further, scholars have recently identified interactions that constitute or involve new types of governance (Emerson et al. 2012; Vangen et al. 2015) or business models (Dahan et al. 2010a), as well as blurred structures and roles (see Crane 2010; Dahan et al. 2010b; Laasonen et al. 2012). For example, cross-sector governance models are viewed as a way to give voice to groups that may typically lack one (Zadek 2014), and collaborative governance processes can be used to share decision-making power (Purdy 2012).

### **Transformational Cross-Sector Partnerships and Interactions**

In order to synthesize collaborative NGO–business partnerships in particular, Austin (2000) develops a continuum for cross-sector collaboration, consisting of philanthropic, transactional and integrative partnerships, and the model later complemented with transformational partnerships (Austin and Seitanidi 2012a, b). The outcomes in the model are evaluated at individual (micro), organizational (meso), and societal (macro) levels (also Selsky and Parker 2005; Seitanidi and Lindgreen 2010), and social, environmental, and economic values can be created by one party or co-created jointly. Other scholars further conceptualize that the outcomes of cross-sector social partnerships can accrue at several levels, and “trickle” both up and down from each level (Kolk et al. 2010). In addition to the tangible results, collaborations can yield intangible ones (Bryson et al. 2015), and these can be further distinguished as (immediate) outputs, outcomes, and (long-term) impacts (Van Tulder et al. 2016; Stadler 2016).

While lasting, multi-level impacts (Seitanidi and Crane 2014; van Tulder et al. 2016; Stadler 2016) from partnerships are possible, scholars raise concerns that cross-sector partnerships and interactions are often transactional and deliver value mainly to the partners rather than benefiting society (Selsky and Parker 2005; Seitanidi and Lindgreen 2010). Yet, partnerships should aim to create social value or innovations (Le Ber and Branzei 2010) that could materialize locally, nationally, or globally (Austin 2014). While the cross-sector literature clearly expects (formal) cross-sector partnerships and collaborations to have transformational

potential (Seitanidi et al. 2010; Skelcher and Sullivan 2008), studies actually documenting such outcomes are rare. This is especially the case with empirical research. Moreover, it is considered difficult to discern whether and how such goals result from the partnering (Rein and Stott 2009). Thus far, only a limited number of studies have explored transformative partnerships (Senge et al. 2007; Seitanidi et al. 2010), or have even discussed how, and what types of, transformational changes could be brought about through collaboration (Murphy et al. 2015; Calton et al. 2013; Montgomery et al. 2012; Quarshie et al. 2016; Wolfgramm et al. 2015).

Among the limited number of studies that begin to chart the area of transformational partnerships or outcomes, Bitzer and Glasbergen (2010) propose that sustainable farming partnerships could aid the transformation of African cotton production, create influential producer organizations, and support differentiation. Sakarya et al. (2012) contend that while social alliances can have incremental or indirect impacts on social, economic, and political systems, their potential to produce significant and direct effects appears limited. Lastly, Senge et al. (2007, p. 51) recognize the need for, and the difficulty of, cross-sector collaborations in finding solutions to sustainability challenges, and they propose that system change requires “enacting new ways of thinking, creating new formal structures and, ultimately, transforming relationships.” In sum, our review suggests that the CSSI literature has thoroughly charted the types, aims, and possible results of cross-sector partnerships and collaborations, but that we still know very little regarding how (the various types of) cross-sector interactions may produce or lead to more radical or transformational impacts (see Seitanidi and Crane 2014; Sakarya et al. 2012; van Tulder et al. 2016).

## **Theoretical Background**

While our theoretical model emerged from qualitative empirical data, we sought a deeper understanding of our findings, as well as the characteristics and nature of the US preparedness system overall, by drawing insights from the literature on systems thinking and theory as part of the theory development stage of this study. We discuss systems theory prior to presenting our results, even though these insights did not drive our data collection and analysis but were integrated into the study as part of our theory development.

Systems theory has close links with various academic fields and disciplines, including physics, biology (e.g., von Bertalanffy 1968), psychology, social sciences (e.g., Parsons 1951), mathematics, engineering, and organizational research (e.g., Kast and Rosenzweig 1972). Von Bertalanffy (1972, p. 417) views a system as “a set of elements standing in interrelation among themselves and with the environment.” He argues that the basic idea in general systems theory, that a system is more than the sum of its parts, can be traced back to as early as Aristotle. Particularly over the past hundred years, systems theory scholars have attempted to develop principles applicable to systems—the organized, higher-level whole—by examining the parts or elements as well as the interrelations or interconnectedness between them (von Bertalanffy 1972).

In organization and management studies, systems theories and approaches can provide helpful frames for examining or depicting complex phenomena related to organizing, organizations, and other formal or social structures (e.g., Kast and Rosenzweig 1972; Senge et al. 2012). Organizational scholars have used systems theories to examine various types of topics, including organizational trust repair processes (Gillespie and Dietz 2009), planning in multi-team systems (Lanaj et al. 2013), and inter-organizational collaboration (Schneider et al. 2016).

The system dynamics approach focuses on the structural and behavioral aspects of systems, such as feedback loops, stock and flow structures, and decision-making behaviors (e.g., Forrester 1958; Sterman et al. 2015). Senge et al. (2012) suggest using such systems thinking tools and techniques to examine and develop greater awareness of interdependencies, complexity, leverage, and change in real-life or “living” systems, such as industries, political entities, or educational institutions. They argue that such systems “continually grow and evolve, form new relationships, and have innate goals to exist and to re-create themselves. Although living systems are like machines in some ways—they have recurring behavior and their future development can be influenced—they are neither predictable nor controllable” (Senge et al. 2012, p. 63).

In discussing the meaning of systems and systemic change, Waddell (2011) as well as Waddock et al. (2015) distinguish between incremental, reform, and transformational types (or scales) of system change. Moreover, Waddock et al. (2015, p. 995) characterize *large* system change as involving “large geographies (e.g., national, regional, and global), multiple institutions, and large numbers of people and resources” as well as “multiple interrelated and connected organizations, institutions, norms, and behaviors at individual, organizational, societal, and global levels.” Building on this definition, and by referring to the systemic change of broader systems in this paper, we focus on large-scale (or transformational) change involving and affecting a large number of people and resources as well as multiple interrelated and interconnected organizations, institutions, norms, and behaviors at the individual, organizational and macro levels. In our empirical study, we especially seek to understand and explain the nature and evolution of the US national preparedness system through the integration of systems theory concepts into our analysis and theoretical explanation.

## Methodology

In our empirical study, we employ a theory-building research method based on a Straussian GT approach (Corbin and Strauss 2014). To produce a robust empirical study and to mitigate the common criticisms of qualitative work, we carefully considered our procedures and made them explicit (Seitanidi and Crane 2014; Yin 2009). Empirical data for our study was collected during the long-term recovery stage for Hurricane Sandy in early 2014 for five months in New Jersey, USA. This context provides a unique viewpoint on disaster response because the area is economically developed and densely populated. Hence, the incident, which occurred in the fall of 2012, had caused extensive financial and infrastructural damage in addition to human suffering. Yet, the response, particularly in New Jersey, was considered to have been a relative success story compared to prior major disasters. It was due to this combination of particularly severe disaster impacts and relatively successful immediate response and recovery efforts that we initially became interested in interviewing humanitarian organizations and studying inter-organizational interaction in this context.

We had access to a major response NGO that had been involved in the Sandy efforts, and we entered the research field with the general intent to study inter-organizational interactions involving different types of organizations. Guided by the research gaps we had observed in prior cross-sector literature, we were particularly keen to find and investigate deeper-level partnerships with transformational aims. While no transformational partnerships appeared to exist within the network, already in the early interviews and field events the issue of significant change within the broader response system started to emerge. Consistent with the GT method, we started asking respondents further questions about it, and similar to Tracey and Phillips (2016), this intriguing lead from our data soon became a major focus of our study.

## Interview Data Collection

Our main data sources were interviews, archival materials, and field data (see Table 1). Following the Straussian approach (Corbin and Strauss 2014), our interview sample (see “Appendix”) was flexible. We had initial contact with a representative of a major response NGO, and this aided our access to a wider responder network. The NGO was one of the lead relief organizations for Sandy in New Jersey. Additional informants were selected from other organizations in a snowballing process, based on suggestions from past informants but with the overall approach guided by theoretical reasons (Corbin and Strauss 2014). All participants had been actively involved in the Sandy operations and were connected to others within the response community. We particularly sought to speak with additional informants who could bring greater richness to our data and help us better understand the key themes that had started to emerge—especially systemic change—thereby helping us to achieve theoretical saturation (Corbin and Strauss 2014).

Respondents were chosen from three sectors: (1) governmental agencies, (2) nonprofit organizations, and (3) private sector companies. The government agencies were key state-level agencies with critical responsibilities in disaster preparedness and response. The sampled government agencies and their senior-level informants had played important roles in coordinating activities and interfacing with the other sectors during Sandy. The chosen nonprofits can be further distinguished as relief NGOs, faith-based organizations (FBOs), and county-based long-term recovery groups (LTRGs). We started by interviewing directors and managers of major response NGOs and FBOs that had played significant roles in providing disaster aid (e.g., mass care, disaster clean-ups) and/or recovery services (e.g., rebuilding and construction) during and after the disaster. Several of these organizations had also played lead roles in the coordination of the overall humanitarian effort by the nonprofit sector in New Jersey, in close collaboration with the government. All of our respondents were well connected within the network, and most had extensive experience from several storms and disasters. In addition to NGOs and FBOs, the informants suggested we include LTRGs in order to understand the interactions and recovery activities at the local level, and we interviewed leaders and managers of three very different groups.

From the private sector, we targeted utility firms and retailers, based on suggestions by our nonprofit and government informants. Informants argued for the inclusion of utility firms since the utilities had tight, regulatory ties to the government and had “always” played key roles in disaster response operations (also see Homeland Security 2004). Moreover, after Sandy, the industry had started networking with the NGO community in New Jersey. We mainly sampled individuals who held key disaster-related directors’ or managerial positions at major utility firms representing the electric and gas as well as and communications sectors. Retailers had started to emerge as increasingly critical actors in disaster scenes, and it was argued that they were critical to preparedness and for a timely return to normalcy after disasters. The two retailers included were large firms: one had a nation-wide operation, while the other operated regionally. The informants held leadership positions in their companies and had extensive expert knowledge of disaster operations.

Overall, we included 29 informants from 18 organizations: nine nonprofits, three government agencies, and six firms. The participants were interviewed in 14 individual and six small-group interviews. The total of 20 interview events lasted, on average, 74 min. Our initial protocol specified broad themes related to cross-sector, inter-organizational interactions, as well as their

antecedents, outcomes, and dynamics, to be discussed in a semi-structured format. While we started by looking primarily for transformational partnerships among other types, as the interview stage progressed we began asking more questions relating to the emergence of “new” actors and systemic change. Two investigators participated in 17 of the 20 interviews, and maintained dialog around key insights. Reflections were undertaken constantly and were used to make further adjustments (Corbin and Strauss 2014). We continued with the interviews until there was sufficient theoretical saturation and we could develop the emerging categories in our theory.

----- Insert Table 1 approximately here -----

### **Archival and Field Data Collection**

In addition to interviews, we collected archival materials and conducted field work (Table 1). A significant share of our archival materials came from the distribution list of the state-level NGO coalition, which the lead investigator was allowed to join for the data collection period. This coalition was the main hub for disaster-related nonprofit activity, and the distribution list served as an interaction platform between the nonprofit members (i.e., response NGOs, FBOs and LTRGs) and their (mainly state-level) government partners. We received near-daily communications (e.g., schedules of upcoming conference calls and meetings, memos and minutes from past calls, and various other communications) for five months. During the interviews, we also asked our informants about archival data relating to inter-organizational interactions, and several informants provided us with highly interesting materials. These included presentation materials and the participant list from a recent NGO-utility firm networking event, which helped us to better understand the recent relationship-building efforts between these sectors. Other informants shared with us the results of a survey the NGO coalition had administered with all the LTRGs on their views of future development needs, which included relationship-building efforts within and between sectors. Lastly, at a later stage of our study, we retrieved from public sources a broad set of US government disaster preparedness documents, which helped us to understand and corroborate our interview findings on the broader system change that has been happening in the national preparedness system at the macro level. This subset of data was analyzed particularly carefully.

The field research further added to our understanding via the observation of practices and interactions taking place in a real-world cross-sector setting. Our frequent and informal contact with past and possible future informants also helped to generate trust and facilitate our access to the responder community. We were invited to observe at several events, including a cross-sector networking event between utility firms, government agencies, and NGOs, as well as at several emergency response conferences where actors from all three sectors were present and interacted. Our observations and reflections especially focused on the ties and interactions happening within and between the three sectors and the key organizations involved in the response network. In addition to attending several such events, we were able to see or tour the informants’ facilities in conjunction with the interviews. The most helpful tour was that of a utility firm’s emergency command center, where we got to hear and see how incidents are managed.

## **Data Analysis and Theory Development**

Throughout the whole process, we maintained rigorous techniques and strove for GT methodological consistency (Corbin and Strauss 2014; Denk et al. 2012). We started developing concepts and categories during data collection, and tried to better understand and saturate emerging themes throughout data collection and analysis. The informants had allowed us to audio record all but two conducted interviews. For those two interviews, detailed notes had been taken by one investigator and verified by the other. We coded the 475 double-spaced pages of interview transcripts and notes line-by-line using Nvivo10 software. We first coded the data for initial categories and concepts related to antecedents, interactions, main effects, and outcomes. Later, we re-coded and analyzed all of the data, focusing more closely on constructs related to inputs, transformational social mechanisms (see Hedström and Swedberg 1998), and outcomes in our emerging grounded model. Continuous comparisons were made between similar and differing statements and contrasted with responses from various types of respondents (Corbin and Strauss 2014). Throughout this process, we did (selective and axial) coding and analysis, and wrote dozens of memos to develop concepts, clarify their inter-relationships, and to increase their level of abstraction. In addition to coding all interview data, we carefully analyzed the government preparedness documents as well as reviewed all of our archival materials and field notes (see Table 1). This analysis process provided us further background information regarding our research setting and the phenomenon under study, as well as helped to corroborate our main findings and improve theoretical saturation of the constructs.

For theory development, we returned to the literature. In addition to cross-sector literature, which had primarily driven our data collection effort in the early stages of the study, we now turned to systems theory (Senge et al. 2012) and the literature on social mechanisms (Hedström and Swedberg 1998), which seemed particularly relevant for the emerging theory and were integrated into our theory building efforts<sup>2</sup>. Similar to Tracey and Phillips (2016), we used the theory and literature to make greater sense of our data and findings, and integrated concepts and insights from them into our analysis and model. We adjusted the theory until it had no evident gaps and explained the phenomenon of interest. It was evaluated against the main indicators of GT credibility, as well as GT applicability criteria (see Table 2) for fit, understanding, generality, and control (Corbin and Strauss 2014; Glaser and Strauss 1967; Rauer and Kaufmann 2015).

----- Insert Table 2 approximately here -----

### **Research Setting**

In this section, we first provide an overview of the broader context of our study, the U.S. National Preparedness System, discussing also its recent evolution. Then, we focus on Hurricane Sandy, the specific setting of our empirical investigation.

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<sup>2</sup> In addition to systems theory and cross-sector interaction and social mechanisms literatures, there are additional theories and literatures that are highly relevant to our findings and grounded model, including the institutional change (Smets et al. 2012), crisis response and management (Moynihan 2009), and humanitarian operations (Day et al. 2012) literatures.

## United States National Preparedness System

According to Homeland Security (2011a), the National Preparedness System provides a process through which all actors within the nation can move forward with their preparedness activities in pursuit of the main preparedness goal: in short, a resilient and secure nation. The preparedness system is officially defined as:

*(...) the instrument the Nation will employ to build, sustain, and deliver those core capabilities in order to achieve the goal of a secure and resilient Nation. The guidance, programs, processes, and systems that support each component of the National Preparedness System enable a collaborative, whole community approach to national preparedness that engages individuals, families, communities, private and nonprofit sectors, faith-based organizations, and all levels of government (Homeland Security 2011a, p. 1).*

Viewed through a systems theory lens (Senge et al. 2012), the definition and the system hence encompass not only the formal structures and operating rules, but also the *social* system comprising of the actors, their patterns of interacting and relating, and the mental models that guide activities and interactions. To better understand the system, and hence the broader context of our study, we carefully analyzed a sub-set of U.S. government disaster preparedness documents (Table 1) as part of the data analysis and theory development stages of our study. The documents provide formal guidance on the system, and our analysis of them suggests that a considerable evolution has taken place in the system over the past fifteen years. Many significant changes have been implemented particularly after the major disasters of 9/11, Hurricane Katrina, and Hurricane Sandy (see Figure 1). While our analysis of the changes forms a part of our findings, we briefly discuss key government documents and major changes to them (see Table 3) already in this sub-section, and elaborate further on the transformation process in the findings section.

----- Insert Figure 1 approximately here -----

As is illustrated in Figure 1, the national preparedness system was primarily guided by the *Federal Response Plan (FRP)* (e.g. FEMA 1992) before and during the September 11, 2001 terrorist attacks. The plan mainly specified federal government roles and responsibilities for disaster response. In other words, disaster efforts were then largely considered a governmental task, led from the federal level. Major changes to the documents and the system itself followed after 9/11, as the *National Response Plan (NRP)* (Homeland Security 2004), which replaced the *FRP*, incorporated a broader range of emergency responders into the system. These included all levels of government (federal, state, local, territorial and tribal), NGOs, and private sector (mainly utility) firms.

Hurricane Katrina, one of the deadliest and financially the most destructive disaster in U.S. history, hit the Gulf coast in August 2005. Its response efforts were considered grossly inadequate, and government actors, in particular, were heavily criticized for the failures (Koliba et al. 2011; Moynihan 2009). These were followed by major changes to the system. The *National Response Framework (NRF)* (Homeland Security 2008) placed a heavier emphasis on the roles of communities and states in disaster efforts, with the federal government role viewed mainly as supporting them in the response. While the concept of ‘whole community’

was not explicitly mentioned in the document, it was clearly assumed that communities and civil society groups should also be involved. Three years later, the new *National Preparedness Goal* (NPG) (Homeland Security 2011b) document explicitly established national preparedness as a shared responsibility of everyone: the whole community. In other words, all actors from the entire nation were expected to contribute; not only all levels of government, but the private sector, nonprofit organizations, faith-based organizations (which are a sub-category of nonprofit organizations but explicitly recognized as their own group), as well as the general public, including community groups, families and individuals. Interestingly, the list of involved actors in the recent government documents starts with individuals and communities, underlining their importance, with government actors listed last (Homeland Security 2011b, p. 1).

----- Insert Table 3 approximately here -----

By the time that Sandy made landfall in 2012, it had hence already been institutionalized that whole communities shared responsibility for disaster preparedness and were expected to contribute by reducing risks and participating in the system's implementation (Homeland Security 2011a). However, edits were again made to the preparedness documents after the Sandy response. For example, the second edition of the *NRF* (Homeland Security 2013) highlighted the need to engage everyone through partnership. Similarly, the second edition of the *NPG* (2015) emphasized the contributions of individuals and communities toward disaster preparedness, as well as the benefits they could gain from it. We further explore this change process, and the role that inter-organizational interactions especially in the context of the Sandy response played in driving the changes, in the findings section.

## **Hurricane Sandy**

Hurricane Sandy developed in the Caribbean Sea on October 22<sup>nd</sup>, 2012, where it strengthened into a category 1 hurricane. It then swept across Jamaica, Cuba, and Haiti, reaching category 2 level winds of 105 miles an hour. The storm swept across the East Coast of the United States, making landfall in southern New Jersey on October 29<sup>th</sup>. While the wind levels slowed down to a post-tropical cyclone there were several anomalies. The area affected by the hurricane extended up to 175 miles, which is much larger than a typical hurricane, and it converged with a nor'easter, sometimes prompting the name Superstorm Sandy. The storm is believed to be responsible for 147 deaths in the northeastern United States, Canada, and the Caribbean (Blake et al. 2012). In addition, there were wide-spread and long-lasting disruptions to utility services, such as power, water and communications, due to the impacts caused by high winds and flooding, in particular. Several states declared states of emergency, airports were closed, train services were suspended, and gasoline was rationed. The Federal Emergency Management Agency (FEMA) reported about \$30 billion in damages in the state of New Jersey alone. In summary, this was a major disaster befalling the northeastern United States.

## **Findings**

Our data analysis revealed three major findings related to the inter-linkages between CSSIs and systemic change in the US National Preparedness System. First, we found that the preparedness system itself is a complex constellation of actors and formal and informal interactions taking

place within and across sectors at multiple levels of the system. Second, we found that a long-term transformation process is taking place in the system, and as a part of this process, the system has undergone considerable expansion, and its goals have been altered. Indeed, the preparedness system has transformed and expanded since 9/11 from a federal government-centric structure, where emergency responders play central roles in disaster response and governance, into a multi-level system where power and responsibilities have increasingly been delegated to lower levels of the system. As a part of this process, the whole community—and hence CSSIs—have been placed center-stage within the system. Third, and most importantly, we found that the successes and failures of the Hurricane Sandy response, especially those related to cross-sector interaction, contributed to this change process. Moreover, we identified four (transformational) social mechanisms (see Hedström and Swedberg 1998) that help explain how the successes and failures of the response and recovery efforts spurred actions and interactions across various system levels. These led to multiple types of systemic impacts that collectively amount to a considerable (macro) system change. In the remainder of this section, we elaborate on these three key findings.

### **The Preparedness System as a Multi-level Constellation of Actors and Interactions**

We contend that the US National Preparedness System is a multi-level constellation where a large number of engaged organizations from the three sectors are “nested” (see Geels 2002; Senge et al. 2012, pp. 16–25) and interact with one another at and across different (jurisdictional) levels (see Fig. 2). Indeed, as recent government preparedness documents outline (see Homeland Security 2011a, b; Homeland Security 2015), the social preparedness system today actually comprises of everyone in the nation. More specifically, disaster efforts are viewed as starting as well as ending at the local level (i.e., in towns, cities and counties), and the whole community—beginning with individuals, families, and broader communities—is expected to actively contribute to preparedness.

----- Insert Figure 2 approximately here -----

As Fig. 2 illustrates, a large number of organizations from each of the three sectors are engaged in the system. Government agencies are key actors within the system especially in that they bear central responsibility for disaster efforts, as well as try to coordinate and unify the activities of the various participants. One central element of the system is the incident command system (ICS), which is a hierarchical structure through which requests for assistance and commands can trickle up or down between (especially government) actors at different levels. The circles in the figure represent sectors or groups of organizations (or subunits or representatives of those organizations) that are involved in the system at each level. Hence, various types of interactions are happening within the system and between sectors at different levels. Some of the engagements may be formalized or contractual, such as a mutual aid agreement between government agencies or a contract between a government agency and an NGO, whereas other interactions happen at an informal or voluntary basis. Moreover, some sectors typically have close ties to one another (e.g., a regulatory relationship between utility firms and government agencies), whereas other relationships may be weak or non-existent (e.g., NGO–utility interactions may involve ad hoc communication about shelter locations). Hence, the two-way arrows that connect the various sectors and actors at different levels of the system can represent various types of interactions and flows. These include collaborations, coordination, requests for assistance, commands, information and resource flows, and reporting, among other types.

## **Expansion and Transformation of the Preparedness System**

The second major finding is that significant expansion and transformation have been and are underway in the preparedness system. We focus on the following two fundamental aspects of the change process: (1) an expansion and transformation of the social system and (2) a transformation process affecting the system's goals.

### **Expansion and Transformation of the Social System**

A significant change process has been on-going in the system since 9/11, and it has considerably affected the constellation of actors and interactions that make up the system (Senge et al. 2012). One major change is that the constellation has expanded. More actors have become active within the system, and, thus, system responsibilities have been altered. Specifically, the system has evolved from a government-centric system (see, e.g., Homeland Security 2004; Koliba et al. 2011), where government and emergency responders have primary roles and responsibilities in disaster settings, into a system where the "whole community" and individuals represent the foundation of the system (see Fig. 2 and Table 4). As a result, government responsibilities, in particular, have diminished in many areas, whereas other actors have stepped up to fill the gaps:

Government informant: Because with Sandy, the maximum that was allowed to be given out from the federal [government] to a citizen was \$31,900. That's it. So then you think, "Well, how are they going to build a house that was swept away with the tidal surge?" You can't. So clearly, we understand that there are unmet needs that FEMA can't address. The state, these private nonprofits, these faith-based groups, the [nonprofit coalitions], they come in to help out where there is a gap. And we as a state support that endeavor to make sure people are made whole in the aftermath of a disaster (GOV K: INF-021).

Another key facet of the shift is that power and responsibilities have increasingly been transferred from the federal (government) level to lower levels of the nested system. The idea is to engage and bring in resources from a greater spectrum of actors in local communities, as response efforts activate at the lowest (i.e., municipal) level of the system. This process has happened gradually over several years, with several key edits in macro-level guidance documents also made after Sandy. These focused on further emphasizing the roles of individuals and local communities as starting points for contributions toward preparedness (see Homeland Security 2015). It appears that by emphasizing the involvement of a broader range of actors who have previously been passive or invisible, such as residents and local businesses, the system's architects are not only challenging prior core assumptions about disaster preparedness but also seeking leverage that would help create a stronger and more representative system (Senge et al. 2007, 2012). Yet, this shift also appears to involve dangers in that the lessening of actors' reliance on federal and state governments may cause greater ambiguities over leadership, as one private sector informant reflected:

Utility firm informant: I always thought that was FEMA's role. FEMA was the leader. They come in, and they're the big mother and father who know what is best for their kids. But you go to FEMA now, and they say, "No, the state needs to take control." And then the state says, "No, the cities and towns need to take control." Someone needs to raise a hand and say, "I'm going to run this ship" (PSO N: INF-025).

----- Insert Table 4 approximately here -----

We further contend that the role of “new” actors has not only expanded operationally but has also been legitimized and institutionalized (DiMaggio and Powell 1983) in the governance of the preparedness system (see Table 4). Specifically, the whole community is now expected to participate in the development of the guidelines and planning documents that steer the system (FEMA 2015b); in other words, they play a role in societal governance by helping define and implement the rules of the system (see Crane 2010; Senge et al. 2012). Closely related, there appears to be an on-going a shift toward blended system structures and fuzzier sector boundaries (Scherer and Palazzo 2011), as the following exchange at an interview suggests:

Government informant: We’ve come to understand that the line [between sectors] has to be fuzzy because the days of being able to claim it to be a hard line just doesn’t work anymore. We need the large food distributors who have million-square foot warehouses out on the [highway] to be functioning or capable of remaining functional to support our needs, not just at the local grocery store level, which is their normal supply chain pathway, but also to support people like the [nonprofit], should they need to be re-supplied, or the [nonprofit] or these 10,000 meals-per-day mass feeding mobile kitchens that we’ve secured using [government agency] funding and delegated over responsibility to own and operate to the [nonprofit]. That’s a great example of that interplay between public and private entities that typically wouldn’t have been seen maybe 15 or 20 years ago. A little bit more segmented back then, I think (GOV J: INF-019).

Investigator: Back then, would you just have all the capabilities?

Government informant: Kind of, yes. Somebody within the state would have been charged with owning and operating and maintaining those vehicles. And then possibly enlisting someone like the [nonprofit] or the [nonprofit] for labor when the need came to turn them on and take them some place. Now, we don’t need to do that (GOV J: INF-019).

What this means is that instead of building extensive networks of public shelters and feeding centers operated by responders, efforts increasingly incorporate partner-operated or contracted structures and private solutions, which are consistent with the core principle of utilizing “scalable, flexible, and adaptable operational capabilities” (Homeland Security 2013, pp. 5–7). It is assumed that such structures and capabilities will be able to expand, contract, and adapt as needs change or the disaster cycle proceeds. Based on our data, this is a bold requirement for the system, as, for instance, a transition from response to recovery may entail that a large number of new participants will become involved in a disaster (e.g., housing agencies) or need to be established (e.g., LTRGs). At the same time, the coordination of efforts by government actors has started to rely more on the “unity of effort through unified command” (Homeland Security 2013, pp. 5–7) than on “unified command.” This change in wording suggests a step away from incident command with formal order and power structures (see Moynihan 2009; Koliba et al. 2011), as in military operations, toward efforts that depend more on mobilizing actors, coordinating and unifying their efforts and resources, and delegating authority (Purdy 2012; Vangen et al. 2015).

## Transformation of the System's Goals

The other fundamental aspect of the change process is that the goals of the system have evolved over time and appear to be undergoing further evaluation. Past evolution is evidenced not only by edits to response goals but also by the creation of an overarching preparedness goal that engages the whole community. As for response goals (see Table 4), recent alterations include the major and current priorities being “to save lives, protect property and the environment, stabilize the incident and provide for basic human needs” (Homeland Security 2013, p. 5). Different actors focus on their own subgoals and expertise areas within the system:

Nonprofit informant: If it's a large-scale Sandy-type [of disaster], at first [my most important network] is going to be all the voluntary organizations because the states and the counties are going to be concerned with clearing the roads and ensuring the safety of the general public. They're not going to trickle down to the individual. They're going to do the most they can for the most people, where we're covering the trickle-down version—making sure that kid gets that cup of hot chocolate on a cold afternoon... (NPO A: INF-001).

The response goals have also been complemented by an overall national preparedness goal that engages everyone in preparedness. The goal was first introduced in 2011 (see Table 3) and is currently formulated as follows: “A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk” (Homeland Security 2015, p. 1). Our analysis suggests that the system's goals are still being debated and are likely to see additional changes. Specifically, some actors we interviewed appeared to be questioning whether the main “social” issue in disaster response was the damage and the needs of disaster victims, or whether it should be the disruption to normalcy (also see Senge et al. 2012; van Tulder et al. 2016). Consistent with such a shift in focus, more attention already appears to be directed at supporting the restoration of normalcy, rather than creating structures for aid. The following two quotes from private sector informants illustrate this issue.

Utility firm informant: [A government official from another state] quickly identified recovery as a supply chain issue. She said it's not ‘who's going to do what?’ It's ‘[retailer] wants to know when you're opening the roads so they can get back into business, so they can help people fix their houses, send their people to work, so they can distribute water, so they can do all those things’ (PSO M: INF-024).

Retail firm informant: ...obviously, we have quite a large number of stores or business elements there in that area. And our standard protocol is in terms of disaster whether it is a hurricane or another large-scale interruption to business, our primary focus is we want to make sure that our associates and the communities there where our stores are located are taken care of. And then, the main things we focus on initially—we want to get the stores and the communities back to self-sufficiency as rapidly as possible. So there's a lot of effort behind the scenes beforehand to have the capacity to be able to do that (PSO Q: INF-028).

This on-going (re-)evaluation of the system's goals could be expected to affect the types of efforts and results that are sought during future disasters; with more focus shifting to the empowerment of civil society and private actors within communities. Several indications of such a trend were already visible during the recent response efforts for Hurricanes Harvey,

Irma, and Maria (Segarra 2017; Sullivan and Holley 2017). It seems plausible to expect that efforts may increasingly take place with just the support of, or even the absence of, government and emergency responders, rather than by them. This shift is illustrated by the following exchange:

Government informant: Of course [retailers] are interested and more than willing to supply volumes, quantities of products, as needed, should the state ask for it and require it, and get them to a feeding kitchen that the [nonprofit] was operating or the [nonprofit] was operating. But more importantly, they want to be able to keep their stores open or get them open as quickly as possible after an event to allow the community to return to some kind of sense of normalcy. Because when you shop at a grocery store that you're familiar with, you're less tense, you're less on edge, and you're more comfortable. And that's the whole point. So we've identified with them certain pieces of information that are of great help to them. And some of it is operational stuff that helps their truck drivers be on the right roads, not go down the wrong roads, let them know what's open, what's closed, where they can go, when they can go. Assist them with curfews in order to keep the wheels of business, the wheels turning (GOV J: INF-019).

Investigator: So was that the shift in [the government's] mindset from 'we'll just supply everything' to 'it's better to have the grocery store open'?

Government informant: Absolutely. It's better to have everything open on a local level, whether that's a bank or whether that's a mobile ATM; it doesn't matter (GOV J: INF-019).

While private actors appear to be taking on larger roles within the preparedness system, community resiliency should not be interpreted as being about economic resiliency only, as was captured by a nonprofit informant:

Nonprofit informant: You look at some of the Irene-based disasters in some of the upstate New York communities that got hit with water that came through their towns in small-town America. When the town residences—what did they want back up and running first? Library, baseball field. That was more important to them than the police department and the fire station. They wanted their life to return to normal. They wanted their community back. And so those towns get their library and their baseball field. That was the heart of their community (NPO B: INF-003).

Taken together, we believe that these changes represent a fundamental transformation process that is occurring in the system, which not only entails an expansion of the system but also affects its overall vision and goals. The shift in priority from an aid-based system to a system focused on establishing normalcy as fast as possible has profound impacts on people affected by disasters. Yet, it remains to be seen whether the system as a whole will, in the long term, be able to agree upon a shared vision that reflects, engages, and brings in resources from all participants (Senge et al. 2012). What might hinder this process is if actors, such as NGOs, find their roles marginalized, which may move their interests in a diverging direction (Vangen et al. 2015).

## **Hurricane Sandy and the Transformational Change Process**

The third major finding of our study is that the successes and failures of the Sandy response appear to have caused further refinement and change in the preparedness system. In the following subsections, we first detail the successes and failures of the Sandy response, especially those related to cross-sector interactions, which appear to have acted as inputs or catalysts for the change. Then, we identify four social mechanisms that provide a plausible explanation for the transformation. Finally, we elaborate on systemic impacts across the system that, as an aggregate, make up the (macro) system change.

### **Successes and Failures of the Sandy Response**

The private sector engagement effort by the New Jersey state government was, in many ways, a remarkable success story of the response. The effort had actually started several years before the disaster and involved the government proactively reaching out to the private sector, especially the food and retail industries, to build closer ties to the sectors' key players. During the Sandy response, multiple types of activities were performed to support private actors from various sectors in staying operational. For example, the state engaged key players from different sectors through daily conference calls, as well as utilized industry associations as information hubs, coordinating two-way communications between their memberships and the government. Food distribution and retail industry representatives were also invited to be present at the state emergency operations center—the “war room” where the operation was led—along with public agencies, utility firms, and NGO representatives. A government informant explains:

Government informant: The other thing that tends to get clogged up during events, disasters, incidents is lines of communication. So if we can somehow have somebody [from an industry association] with us or close to us... who can reach out and touch with a blast email or a blast tweet, 1400 entities—then that's a lot less phone calls that our limited communications network in the [state agency] may be getting (GOV J: INF-019).

These efforts supported private sector actors' access to information, resources, and other types of assistance from the state, which considerably aided and speeded up community resiliency and recovery. While similar public-private connections and activities have also been developed in other disaster-prone areas, the intensive relationship-building and interaction that took place in the Sandy context can nevertheless be considered a new pattern of relating between the sectors as a part of a large-scale response to a major disaster (see Senge et al. 2012). As the effort was widely considered a success, the Sandy experience provided important new lessons for various actors on the benefits of such an engagement to disaster response and recovery.

Another area of interaction that can be considered a relative success story relates to the interactions among and between nonprofit and government organizations as a part of the immediate response. Within the state, large numbers of relief NGOs, as well as other nonprofit, voluntary and faith-based organizations participated in the Sandy efforts. Their interaction hub was a state-level coalition of nonprofit organizations that coordinated the voluntary efforts in close collaboration with key state and federal government agencies. Several of the larger NGOs had been contracted by the state to be official lead organizations in the response efforts, such as providing mass care (e.g., sheltering and feeding). Moreover, voluntary and faith-based organizations played important roles in answering phone calls through which the public could request assistance, coordinating and providing disaster clean-up activities, performing

fundraising and handling donations, and addressing a wide range of material, physical, and psychological needs of disaster victims. Overall, many informants concluded that, while there could have been some more structure and efficiency to the efforts and their coordination, the organizations and actors were generally successful in their response efforts, as the following interview quotes suggest:

Nonprofit informant: [Sandy] wasn't catastrophic. Given that 40-some people died across the tri-state area, it was catastrophic for those families and the billions of dollars in damage. But to look at 9/11 in the way that it impacted the economy and that area of Manhattan and everything broke down. You had a failure to communicate between organizations, even the fire department and the police department. You look at things like that—catastrophic failures did not occur during Sandy (NPO B: INF-003).

Nonprofit informant: Again, New Jersey did a fantastic job compared with what we've seen from other areas and from our own training and experiences. Just from the get-go, it was controlled (NPO D: INF-006).

In addition to positive lessons, many areas of improvement were mentioned in the interviews. For example, the engagement, mobilization, and preparedness levels of individuals, local communities, and towns were viewed by many as insufficient, especially when compared with those of states where residents and communities are more knowledgeable about disasters (also see Kapucu 2008). A nonprofit informant reflected on the differences:

Nonprofit informant: ... [New Jersey] needs the same level of action, access—needs the same level of attitude that Florida has and Louisiana has. And it's not there yet. New Jerseyans don't think of themselves like that yet. So they're not going to necessarily prepare as well as people in Florida do. So who fills the gap? Government. And if government can't fill the gap, they look to NGOs to help support that (NPO B: INF-003).

In addition to lacking individual and community preparedness measures, responders had experienced additional challenges in interfacing and engaging with individuals. For example, the NGO-operated call line that fielded requests from the general public for assistance initially became overwhelmed by approximately 100,000 calls. A government agency that coordinated contacts of unaffiliated volunteers and groups was not able to keep up with the volume of calls and emails as well. Moreover, many utility firms struggled significantly not only with restoring their services but also with customer communications. Overall, while there were also many successes related to individual engagement—including successful nonprofit fundraising efforts and programs, an effective campaign to prevent donations of used clothing, and countless examples of residents and local businesses helping their neighbors—the Sandy experience revealed multiple weaknesses at the local levels in disaster preparedness, response, and recovery activities and structures. Because of these weaknesses, the system was not always able to connect disaster victims effectively with the resources or services they needed or that might have been available.

Another significant challenge area that was frequently brought up concerned interactions and efforts among and between governmental and nonprofit organizations during the long-term recovery stage. While most informants considered government-nonprofit interactions well-functioning during the immediate response, the transition to the recovery stage presented a host of new challenges. These included difficulties in establishing a considerable number of new long-term recovery groups (LTRGs), which coordinated recovery efforts and served residents

in different counties within the state. Further, many government agencies at various jurisdictional levels that do not normally deal with disasters found themselves involved in the recovery efforts. As a result, relationships and communication channels between “old” and “new” system actors had to be established, despite there not having been much prior interaction between the parties. Particularly, the nonprofit organizations referred to challenges with such activities, as well as the rigidity of government organizations and programs. This was a clear contrast to how the activities during the immediate response had been described:

Nonprofit informant: Well, I think that relationship, there needs to be more involvement between the long-term recovery groups and the government officials. Because folks in town know about the local township, borough administration, that’s who they know about. They don’t know about this group over here called the LTRG. So if there’s a way to have a better connection. I totally get it though that there’s always a big push that this is not a government solution (NPO E: INF-008).

### **Transformational Change Mechanisms**

Our empirical findings suggest that the disaster response experience from Hurricane Sandy, including the successes and failures related to cross-sector interaction, triggered further change in the disaster preparedness system. In this subsection, we identify four social mechanisms that provide an explanation for how the successes and failures of the Sandy operation led to systemic change after the disaster (Table 5). According to Hedström and Swedberg (1998), social mechanisms can help understand how two types (or sets) of events or variables are connected to one another. We are primarily interested in transformational mechanisms, which explain how (meso-level) social actions and interactions by entities operating at various levels of the preparedness system collectively produce a macro-level system change (Hedström and Swedberg 1998; Davis and Marquis 2005; Anderson et al. 2006).

----- Insert Table 5 approximately here -----

*Learning* Learning is one of the most important mechanisms linking the successes and failures of the Sandy response to macro-level system change, and the theme emerged in nearly all the interviews. Several subthemes (or properties) of learning can be distinguished from our data, including the evaluation and documentation of successes and failures, (organizational) learning, and the diffusion of learnings (see Table 5). Evaluation appears to be performed by all types of organizations (as well as groups of organizations) within the system, and it often involves comparing the efforts for the current disaster to those that have happened previously. Documentation can involve the production of various types of after-action reports, “books,” binders, or other records of the efforts and learnings. As for (organizational) learning, it is evident that many actors had initially scrambled and had been forced to learn by doing throughout their Sandy efforts. However, the processes for the diffusion of learnings after Sandy appeared more structured, and involved organizations sharing learnings internally (e.g., with other divisions and headquarters) and externally (e.g., with the industry or other stakeholders), across various levels of the system. Multiple channels were used to diffuse learnings, including professional associations and trade groups, task forces, planning groups and training courses, conference calls, meetings, conferences, as well as other communication channels and interaction hubs.

*Regulating* Regulating (or adapting regulation) is another key social mechanism that emerged from our data. By regulation, we refer not only to governmental or “hard” law regulation, but

also to self-regulation or “soft” law regulation (see Scherer and Palazzo 2011). According to our informants, additions and updates were made to laws and regulations at various jurisdictional levels of the system, post-Sandy (Table 5). Some of these changes related to those aspects of cross-sector interaction that had proven either successful or problematic during Sandy, such as utility communications with the public. Moreover, additions and changes were made to a vast range of guidance and policy documents that steer the preparedness activities and efforts of governmental, private, and nonprofit organizations, and various groups of organizations, across the system. Both types of regulation appear to play a significant role not only in system transformation, but also in the settlement and institutionalization of the “new” system.

*Interconnecting* For the purpose of this study, we view interconnecting mainly from the perspective of interconnecting various parts of the social system, although the term has also been used in the literature to describe the interconnecting of different types of systems (Valente 2012; Hoffman 2003). Nearly all informants emphasized building stronger relationships and interconnectivity with existing partners and/or reaching out to new actors as something that they had focused on, or been pushed to do, after Sandy in order to be better prepared for future disasters. Indeed, informants at all types of organizations and system levels appeared to share the belief that developing a better awareness of other system actors and fostering relationships with them were the key to significantly improving the system.

*Re-engineering* The fourth, and final, social mechanism in Table 5 is re-engineering, which encompasses various organizational and inter-organizational actions related to creating, building, or improving programs, processes, structures, or other aspects of the system, based on the successes and failures that happened during the efforts. The processes of setting up or refining government programs, for instance, appear to be slower and more bureaucratic than most other aspects of re-engineering the system, including private sector and NGO system improvement efforts. Despite the rigidities on the government side, a significant re-engineering and broader transformation of the system appears to be possible and occurring in this context as an aggregate result of a large variety of activities and actions by all the system participants. In the next subsection, we further elaborate on the systemic impacts that resulted from the social mechanisms that were identified.

## **Systemic Impacts of Hurricane Sandy**

As previously discussed, the efforts for Sandy were a relative success story, yet the disaster experience had involved both successes and failures. Through social mechanisms, including the four that were presented in the previous subsection, the successes and failures caused a host of impacts across the system post-Sandy, as various actors sought to improve aspects of the system. As previously outlined, guidance, systems, programs, and processes form critical parts of the preparedness system (Homeland Security 2011a, p. 1). Next, we briefly describe some of the impacts on two of these aspects: guidance and (social) systems.

*Impacts on Guidance* Hard and soft law regulation and guidance provide an institutional basis for the system, and hence, also a “template” for future disaster efforts. The aftermath of Sandy resulted in “substantial” additions and modifications to government legislation and regulations at various jurisdictional levels. Many types of examples emerged from our data, such as the care of pets in sheltering situations, fire code issues related to volunteer housing, and age-limits

of youth volunteering in reconstruction sites. Some of the changes were related to the major successes and failures of cross-sector interaction during Sandy:

Government informant: There were a number of requirements laid on [the utilities] by regulation subsequent to Sandy. Some were in the neighborhood of 100 different items that they were tasked... A lot of it is in terms of information visibility, transparency. Some of it is customer service oriented. Responding to not only the state but the individual customer base in certain ways... And most of them are plowing through the requirements rather hastily. Their intent was to be ready for the next [incident] so they wouldn't have to keep revisiting the same mandates, the same requirements (GOV J: INF-019).

Furthermore, Hurricane Sandy resulted in a significant number of changes in the government's disaster preparedness documents and guidance at all levels (see Homeland Security 2015; FEMA 2015a, c). Such documents spell out key requirements, recommendations, and assumptions about disaster preparedness. One example of recent changes in federal-level guidance, the second edition of the *National Preparedness Goal* is stated to incorporate "critical edits identified through real world events, lessons learned and implementation of the National Preparedness System" (FEMA 2015a, p. 1). As Table 3 suggests, post-Sandy there has been an increased emphasis on engaging the whole community in disaster preparedness. It seems logical that this change has been influenced by the successes and failures of the Sandy efforts in the most heavily impacted states.

The Sandy experience was also reflected in many types of "soft law" regulation and guidance produced by other actors and groups at all system levels. The successes and failures hence resulted in the production and updating of a broad range of organizational, sectoral, and cross-sector preparedness, continuity and resiliency plans and documents, training materials, standards, memorandums of understanding, and other forms of guidance documents. These guidance documents were also shared (as part of diffusion of learnings) internally and externally:

Nonprofit informant: Other states are looking at how New Jersey handled it. It was deemed a huge success, notwithstanding what you found in the papers... It was a huge success the way it worked here. But FEMA is taking that and revising the whole course on how nonprofits and faith-based organizations and other volunteer agencies work in disaster response based on Sandy. So the whole nation is learning from us and what happened here. So it's kind of significant (NPO D: INF-006).

Overall, additions and changes to regulation are important in disaster preparedness because, as high uncertainty environments, disaster response does not traditionally encourage organizations or individuals to innovate and take substantial risks, but rather rewards those that conform to mandates, guidelines, and established practices (e.g., DiMaggio and Powell 1983; Tate et al. 2011). Yet, many informants viewed guidance documents mainly as templates, and contended that in reality, layers of plans and documents exist at different levels and parts of the system. Therefore, changes in guidance alone will not result in profound system change, as the following quote illustrates:

Nonprofit informant: After every event, we sit in these big meetings and you hear variations of these themes: I can't believe that our forbearers were so short-sighted and if they had just done this, things would have been so much easier. And this time around,

we will never forget. And we just got a grant to do an after-action report where we're going to make a big binder of all of the things that we learned and we're going to put it on the shelf next to the other big binders that say exactly the same thing (NPO F: INF-009).

*Impacts on Systems* In this subsection, we focus primarily on the systemic impacts that Sandy had via social mechanisms on social systems. In our specific research context, the state of New Jersey, the Sandy experience catalyzed a multitude of organizational efforts at the local and state levels, which together can help create a stronger and refined social preparedness system. For example, the challenges that public and nonprofit agencies had experienced in interacting and interfacing with individuals at the local level led to increased emphasis on developing solutions that will help mobilize and engage individuals and communities in the future:

Nonprofit informant: And [the government agency] are also in the process of getting state-wide funding to be able to have a volunteer database... that will allow unaffiliated volunteers to sort of sign up and say "What's out there? I want to volunteer, how can I help?" and be able to manage that (NPO C: INF-005).

There was also an on-going effort by government and nonprofit organizations to try to develop a strong long-term recovery group structure, in order to effectively coordinate inter-organizational recovery efforts and work with residents locally during future disasters:

Nonprofit informant: We've put a lot of effort behind really getting guidance and governance into long-term recovery groups... So that's something that as a collaborative we really have to look at through a post-Sandy lens to say, "We owe the counties this responsibility to rebuild this [county NGO coalition] structure" (NPO B: INF-002).

Nonprofit informant: I think one of the things that would be a good thing – what I've heard from different groups – is, we're so focused now on making our groups work, and then distributing the money properly and vetting people... [but] what about in the future? It's not only the resiliency going forward... but also who do we call? What do we do? If another disaster hits and it's 2024, whose names do we have that could be instrumental in putting the pieces together and helping us figure out how to do this (NPO H: INF-016).

While most of our interview data on impacts on social systems relate to New Jersey, it is evident that via social mechanisms such as learning and regulation, there will also be similar impacts in other states within the country. For example, the successful private sector engagement effort that had taken place during Sandy helped to catalyze changes not only in New Jersey, but also in other parts of the country. Post-Sandy, the state itself had already begun engaging new sectors and segments of the private sector through relationship building and the signing of new memorandums of understanding. Furthermore, as the learnings of the Sandy operation had been documented and diffused to various other agencies, increased emphasis had recently been placed on public-private partnerships and interaction in different areas of the country:

Utility firm informant: And that's happening in every state now. Where [the government agencies] are bringing the private-public relationship in. And the most emphasis being on how we communicate with each other. How do we talk to each other? And how can we better assist as we go along? Whether they can provide clearing out roads for us or whether we can provide them with the communication on where our supply chain is coming in from areas to help out (PSO N: INF-025).

To conclude, the overall system change that has happened in the aftermath of Sandy appears to be a sum of incremental systemic impacts on guidance, (social) systems as well as other

aspects of the system that are occurring at different levels and parts of the system through actions and interactions (i.e., social mechanisms) by the system participants (also see Senge et al. 2012). Next, we propose a theoretical model that illustrates the transformation process.

### **Proposed Model**

Our grounded model, Fig. 3, brings together the successes and failures (inputs), four transformational change mechanisms (social mechanisms), and systemic impacts (outcomes) that explain how the aggregate (macro-level) systemic change came about in the aftermath of Hurricane Sandy (also Hedström and Swedberg 1998; Davis and Marquis 2005; Anderson et al. 2006). The overall systemic change is hence the result of actions and interactions by a large number of system participants who are likely motivated to act urgently because major disasters not only can cause significant financial and material damage, but are also a matter of life and death (Day et al. 2012).

While our model seeks to explain post-disaster transformational change only, we believe that a major disaster, such as Sandy, first becomes a real-world experiment of the (macro) preparedness system that is in place at the time of the disaster. In other words, the disaster tests the system's implementation across multiple system levels and sectors in that particular geographic context (see Tomasini and Van Wassenhove 2009; Senge et al. 2012, pp. 273, 274). The transformational change mechanisms portrayed in Fig. 3, on the other hand, explain how a "new" (macro) system is created as a result of organizational (and individual) action and interaction in the aftermath of the disaster (see Hedström and Swedberg 1998, p. 22).

----- Insert Figure 3 approximately here -----

While our empirical study focused solely on Sandy, archival material sources (FEMA 2015a, c) and examples provided by our informants suggest that Hurricane Katrina and 9/11 also had had a tremendous effect on the national disaster response system that was in place before Hurricane Sandy. However, in the case of prior major disasters, it often appears to have been the failures in the response, including the lack of cross-sector (and intra-sector) interaction as part of the response, that have spurred systemic changes:

Government informant: So he had seen a lot of this. And he also spent a lot of time as a high-level [government] official at Katrina. So he saw a lot of what went right and wrong down there. And he had a lot of interesting ideas when he came to [the state] about making these efforts to try to build these bridges. And we started out 4 years ago – way before [Hurricane] Irene – working with the food sector; the food distribution sector (GOV J: INF-019).

Indeed, in the context of Katrina, failures in cross-sector interaction emerged in private sector engagement as well as in the involvement of faith-based and community organizations (FEMA 2015a, c). Further, prior literature reveals challenges in intra-sector interactions between government entities operating at different levels and areas of the system (Koliba et al. 2011). Overall, while the inputs, mechanisms, and impacts of prior as well as more recent disasters vary, the overall logic of Fig. 3 can be applied to all major disasters. Taken together, major disasters appear to contribute significantly to the long-term system change process that has been, and is, occurring at different levels and parts of the system. Nevertheless, it is worth pointing out that also other exogenous shocks may have caused and continue to cause further

changes in the system. These include administrative and leadership changes as well as other types of events which may put pressure on the system to change.

Most importantly, our study showed that significant changes to the National Preparedness System have been triggered by experiences from major disasters, including the successes and failures of cross-sector interaction. These have led via organizational actions and interactions (i.e., social mechanisms) to different types of systemic impacts across the system, as part of a long-term evolutionary process. These findings are consistent with extant systems literature, which suggests that one way to achieve progress in real life is through exploration and making mistakes (Senge et al. 2012, pp. 273, 274). As for future research implications, in our specific context, humanitarian disasters appear to create a great sense of urgency among the actors to act and interact to improve the system, which collectively produces a significant system change after a major disaster. For many other societal challenges, such as social inequality or global biodiversity reduction, problems typically manifest themselves or exacerbate more gradually, and hence, any (transformational) change processes are likely to be initiated and evolve differently. Further investigations of possible catalysts, mechanisms, impacts, as well as change process developments in such contexts therefore appear to be necessary. Second, our study highlighted the possibilities of finding great leverage (Senge et al. 2012) from whole community-based approaches to “wicked” problems. Nevertheless, such solutions also can pose considerable challenges for various system actors, and, hence, we would like to encourage scholars to examine ways in which individuals and communities can most effectively be engaged in transformational change efforts.

Our study provides insights also for practitioners and policy makers. First, the Sandy experience shows that expanding the constellation of system actors to include new partners such as private businesses can lead to a stronger system. Following the same logic, we could expect to find nontraditional actors in other contexts as having untapped potential to help co-create novel solutions to complex problems. Yet, a significant privatization of regulatory power and public responsibilities (see Moog et al. 2015; Scherer and Palazzo 2011) seems to merit careful consideration, even if government agency failures have previously been witnessed (e.g., Koliba et al. 2011). Prior research has warned that social services provided by private companies or via dispersed governance networks may be delivered in a less open, democratic, accountable, and transparent manner (Devinney 2009; Koliba et al. 2011; Skelcher and Sullivan 2008).

In addition, we see problems in the transfer of responsibility for disaster preparedness to individuals, communities, and other “voluntary” participants, as not all the actors or groups may have the monetary or other resources necessary to prepare, respond, or recover from major disasters or keep up sufficient service levels to their beneficiaries or stakeholders. Such challenges appear to have already surfaced in the immediate response efforts for Hurricane Maria in Puerto Rico (Santana and Gillespie 2017), for example. These considerations are important to debate and address because disaster aid provisioning should follow the principles of neutrality, humanity, and impartiality (Tomasini and Van Wassenhove 2009). Nevertheless, our findings suggest that the institutionalization of individual involvement, whole community-based approaches, and CSSIs in systems and guidance documents could be helpful also in other contexts where transformational impacts are sought or needed. As one example, the new Sustainable Development Goals (United Nations 2015) incorporate partnering for the goals as one of the 17 main goals. We believe that this inclusion is a promising way of seeking leverage in that “system” (Senge et al. 2012), and it is worth modeling in other contexts.

## **Conclusions**

The main purpose of this study has been to further our understanding of the inter-linkages between CSSI and systemic change in the US National Preparedness System. The empirical investigation presented in this paper was grounded in data collected from a cross-sector network operating in a major disaster setting: Hurricane Sandy in New Jersey. This context enabled us to examine CSSIs as part of broader systems and their transformation processes over time. While extant CSSI literature has primarily predicted that transformational impacts in systems could be expected to result from transformational cross-sector partnerships, our findings point to a new perspective that has so far been largely overlooked by scholars. Specifically, what we found in our research context is that the preparedness system itself is a complex, multi-level constellation of actors as well as formal and informal, cross-sector, and within-sector interactions. In addition, we found that the constellation is expanding as part of a long-term change process. Our analysis revealed a shift to a whole community approach to disaster preparedness. Today, all actors are expected to not only take shared responsibility for preparedness but be closely involved in the collaborative (political) processes through which the planning documents are created and the rules of the system defined and implemented. The system's visions and goals are also undergoing changes and evaluation, which may have broad implications on the ways in which aid gets provisioned in future disasters. The recent hurricanes, Harvey, Irma and Maria, are likely to add further nuances, such as those related to climate change mitigation and adaptation, to these conversations (Delk 2017).

Importantly, our findings suggest that the disaster experience from Sandy, including the successes and failures of interaction, acted as catalysts for organizational actions and interactions (i.e. social mechanisms), which produced various types of systemic impacts that as an aggregate make up the (macro) system change. Further, many changes that have occurred and been institutionalized in the system after the disaster are likely to encourage further cross-sector interaction in disaster settings in the future. Overall, while our study focused specifically on a disaster response setting, it is our belief that this work has the potential to be relevant to both CSSI research and practice at large, and can help open valuable new avenues for future research, including studies on sustainability initiatives.

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**TABLE 1: Other Data Sources and Their Use in Research**

<b>Type of Archival Data</b>	<b>Number of Documents</b>	<b>Description</b>	<b>Source of Data</b>	<b>Use in Research and Data Analysis</b>
E-mails	137	E-mails sent during a five-month period to the disaster response NGO coalition listserv (recipients were NGO members and government partners).	NGO coalition distribution list.	During data collection, the near-daily NGO coalition communications (emails, memos and meeting minutes, and other attachments) were used to gain a better understanding of NGO and government actors within the network and their interactions, collaborations and events taking place within the state. The data provided support to our sampling decisions, as it helped to ensure we understood the social system and had covered key actors within the NGO community. During data analysis, these data were reviewed to ensure it corroborated findings from interviews and other data. The data also improved our understanding of the research setting and phenomenon of interest.
Memos and meeting minutes	21	Memos and minutes from NGO coalition inter-organizational calls and meetings.	NGO coalition distribution list.	The memos and meeting minutes from the NGO coalition calls and meetings contributed to our understanding of the interactions happening among the NGO coalition members (NGOs, FBOs and LTRGs) and their state government partners. The documents listed all call/meeting participants and summarized the discussions, which helped to triangulate our findings e.g., on the structure and expansion of the social system, as well as interactions within it.
Other e-mail attachments	17	Additional attachments to e-mails.	NGO coalition distribution list	The various other attachments (e.g., job or event advertisements, briefing materials) helped to provide background information about the research setting, phenomenon of interest, and social system.
Other archival materials (reports, surveys, presentations)	10	Selected archival materials collected from informants, relating specifically to inter-organizational interactions.	Informants.	We included in our database mainly archival data relating to inter-organizational interaction within the system. These included presentation materials and a list of participants from a recent utility-NGO networking event, as well as the results from a survey the NGO coalition had conducted among LTRGs. Such data triangulated our findings on the constellation of actors, post-Sandy expansion of the system in NJ, and interactions taking place within it.

Government documents	23	Key U.S. government documents on disaster preparedness, response, recovery and other stages (e.g. documents in Table 3).	Publicly available sources.	The government planning documents were retrieved and analyzed closely to help us better understand and reach theoretical saturation on the system change happening in the national preparedness system; especially the regulatory changes at the federal level. These insights and findings corroborated our interview data and other data sources, and were integrated into the emerging theoretical explanation.
<b>Type of Field Work</b>	<b>Number of Events</b>	<b>Description</b>	<b>Length (Total)</b>	<b>Use in Research and Data Analysis</b>
Event observation	5 events	Observation of cross-sector interaction at networking events, practitioner conferences, and community meetings.	4.5 days	During data collection, participation in field events helped us generate trust among system participants, identify and pursue new leads for interviews, and triangulate interview findings with our own observations. During data analysis, our observations and notes were used to corroborate the findings on the structure and expansion of the social system (in NJ), and on cross-sector and within-sector interactions and collaborations taking place within the system.
Facility tour	1	Utility firm emergency operations center.	1 h	The utility firm emergency operations center tour especially contributed to our understanding of the difficulties utility firms had encountered in restoring their services as well as communicating with their customers in the aftermath of the disaster.

**TABLE 2: Grounded Theory Applicability Criteria**

Criteria	Method to Ensure Criteria
<p><i>Fit</i></p> <p>The data matches the phenomenon</p>	<ul style="list-style-type: none"> <li>• Prior literature was reviewed to provide a starting point for empirical study.</li> <li>• The chosen context was a major disaster scene.</li> <li>• Data was collected and analyzed guided by theoretical sampling.</li> <li>• A large number of informants with broad expert knowledge were included.</li> <li>• An archival data set brought richness to data.</li> <li>• The researchers had extended involvement in the field.</li> <li>• They approached the respondents and data with sensitivity.</li> </ul>
<p><i>Understanding</i></p> <p>The findings and theory are easily understood</p>	<ul style="list-style-type: none"> <li>• Categories were fully developed for variation.</li> <li>• Sufficient description and proof quotes were provided.</li> <li>• The main findings were shared with experts and non-experts.</li> <li>• Feedback was incorporated into the article.</li> </ul>
<p><i>Generality</i></p> <p>The findings and theory are applicable to other settings and groups.</p>	<ul style="list-style-type: none"> <li>• The informants represented organizations from three sectors and had cross-sector interaction experience.</li> <li>• Most informants had experience of other regional, national and/or international disasters.</li> <li>• Sufficient interview length and semi-structured format allowed participants to reflect and add topics.</li> <li>• Researchers could pursue new leads and ideas.</li> <li>• Prior literature was integrated.</li> <li>• Researchers tapped into their own relevant experience.</li> </ul>
<p><i>Control</i></p> <p>The findings and theory can be used to effect change.</p>	<ul style="list-style-type: none"> <li>• The findings can have implications and impacts on practice and policy.</li> </ul>

**TABLE 3: Changes to U.S. National Preparedness Documents**

<b>Document name</b>	<b>Year</b>	<b>Description of document</b>	<b>Major changes or additions</b>
<i>Federal Response Plan (FRP)</i>	1992	The <i>FRP</i> presents the coordination mechanism for federal-level assistance and resources to complement state and local government efforts (FEMA 1992, 1999).	The <i>FRP</i> is a signed agreement that applies to federal departments and agencies and its main focus is on <b>federal government</b> responsibilities and roles.
<i>National Response Plan (NRP)</i>	2004	“The purpose of the <i>NRP</i> is to establish a comprehensive, national, all-hazards approach to domestic incident management across a spectrum of activities including prevention, preparedness, response, and recovery.” (Homeland Security 2004, p. 2).	In addition to federal government, the <i>NRP</i> integrates <b>all levels of government</b> , as well as the <b>private sector</b> and <b>NGOs</b> , into an incident command (or management) system.
<i>National Response Framework (NRF)</i>	2008	The <i>NRF</i> “is a guide to how the <b>Nation</b> conducts all-hazards response. It is built upon <b>scalable, flexible, and adaptable</b> coordinating structures to align key roles and responsibilities <b>across the Nation</b> ” (Homeland Security 2008, p. 1).	It describes how the <b>federal government supports communities and states</b> in major disasters, integrating lessons learned from Hurricanes Katrina, Rita, and other disasters (Homeland Security, 2008, 2013).
<i>National Preparedness Goal (NPG)</i>	2011	The <i>NPG</i> establishes an overall preparedness goal and national preparedness as the shared responsibility of the whole community: “[e]very member contributes, including individuals, communities, the private and nonprofit sectors, faith-based organizations, and Federal, state, and local governments” (Homeland Security 2011b, p. 1). The document describes the core capabilities that are needed to deal with the risks that disasters pose.	The <i>NPG</i> explicitly refers to the <b>whole community</b> , and lists individuals and communities among key actors that are included in the system.
<i>National Response Framework (2<sup>nd</sup> ed.)</i>	2013	<i>NRF</i> “is a guide to how <b>the Nation</b> responds to all types of disasters and emergencies. It is built <b>on scalable, flexible, and adaptable</b> concepts identified in the National Incident Management System (NIMS) to align key roles and responsibilities <b>across the Nation</b> ” (Homeland Security 2013, p. 1).	The 2 <sup>nd</sup> ed. puts <b>more emphasis on the concept of whole community</b> and talks about the need to <b>involve and engage everyone</b> .
<i>National Preparedness Goal (2<sup>nd</sup> ed.)</i>	2015	The <i>NPG</i> establishes an overall preparedness goal and that “preparedness is the <b>shared responsibility</b> of our <b>entire nation</b> . The <b>whole community</b> contributes, <b>beginning with individuals and communities</b> , the private and nonprofit sectors, faith-based organizations, and all governments (local, regional/metropolitan, state, tribal, territorial, insular area, and Federal)” (Homeland Security 2015, p. 1). It also outlines the needed core capabilities.	The goal remains the same but there are changes within the goal. The 2 <sup>nd</sup> ed. especially stresses the importance of preparedness efforts by individuals and communities. It incorporates lessons learned and insights from recent disasters and events (Homeland Security 2015, p. 1).

Notes: Text bolded by authors to add emphasis. The table summarizes selected preparedness documents only.

**TABLE 4: Transformation of the National Preparedness System**

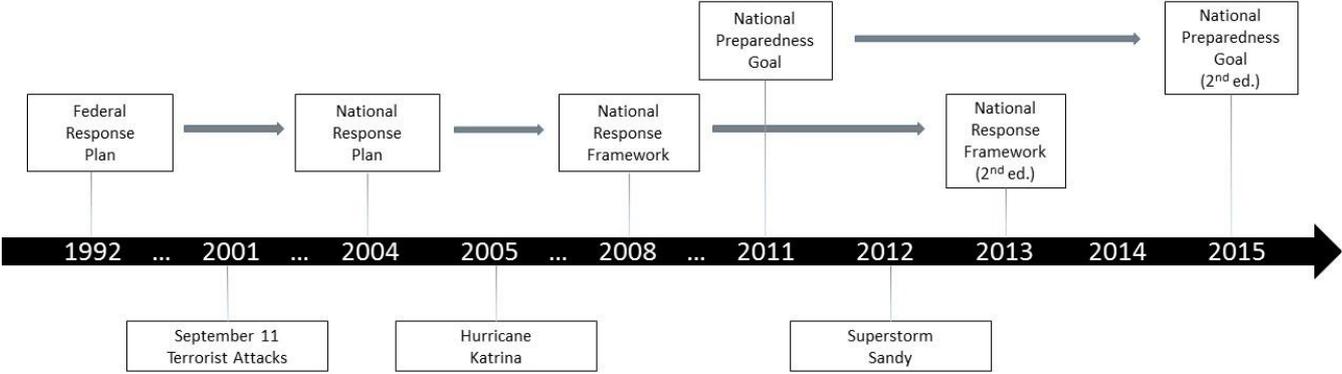
	<i>Disaster Preparedness System Before Hurricane Katrina</i>	<i>Disaster Preparedness System After Hurricane Sandy</i>
<b>Changes in Social System</b>		
<i>Constellation of Actors</i> <ul style="list-style-type: none"> <li>• Central role and responsibility</li> <li>• Additional key actors</li> </ul>	Government.  NGOs and private sector (utility) firms.	Whole community.  Individuals and communities, nonprofits and civil society, utility and other private sector firms, and all levels of government.
<i>Roles</i> <ul style="list-style-type: none"> <li>• Role of government</li> <li>• Role of NGOs</li> <li>• Role of utility firms</li> <li>• Role of businesses</li> <li>• Role of individuals and communities</li> </ul>	Active. Active. Active. Passive. Passive.	Active. Active. Active. Active. Active.
<i>System Structures and Governance</i> <ul style="list-style-type: none"> <li>• Governance model</li> <li>• System structures</li> <li>• Control mechanism</li> </ul>	Traditional, government-centric model. Scalable emergency responder structures; clear governance structures. Unified command.	New, whole community-centric model.  Scalable, adaptable and flexible structures; hybrid or blended governance structures. Unity of effort through unified command.
<b>Changes in System Goals</b>		
<i>Response Goals</i> <ul style="list-style-type: none"> <li>• Formal response goals</li> </ul>	Save lives and protect property and the environment.	Save lives, protect property and the environment, stabilize incident, and meet basic human needs.
<i>Preparedness Goals</i> <ul style="list-style-type: none"> <li>• Formal preparedness goal</li> </ul>	Not applicable (goal introduced in 2011).	A secure and resilient nation
<i>Social Issue</i> <ul style="list-style-type: none"> <li>• Main social issues</li> <li>• Main channels for aid</li> </ul>	Disaster impacts and needs of victims.  Emergency responder structures.	Disaster impacts and needs of victims; community resiliency and disruption to normalcy. Private stores and service providers; emergency responder structures.
Sources: Austin and Seitanidi (2012a, 2012b); Crane (2010); FEMA (2015a, 2015b), Homeland Security (2004, 2008, 2011a, 2011b, 2013, 2015); Purdy (2012); Scherer and Palazzo (2011); Seitanidi and Crane (2014), Senge et al. (2012), and interview transcripts.		

**Table 5: Data Table for Social Mechanisms**

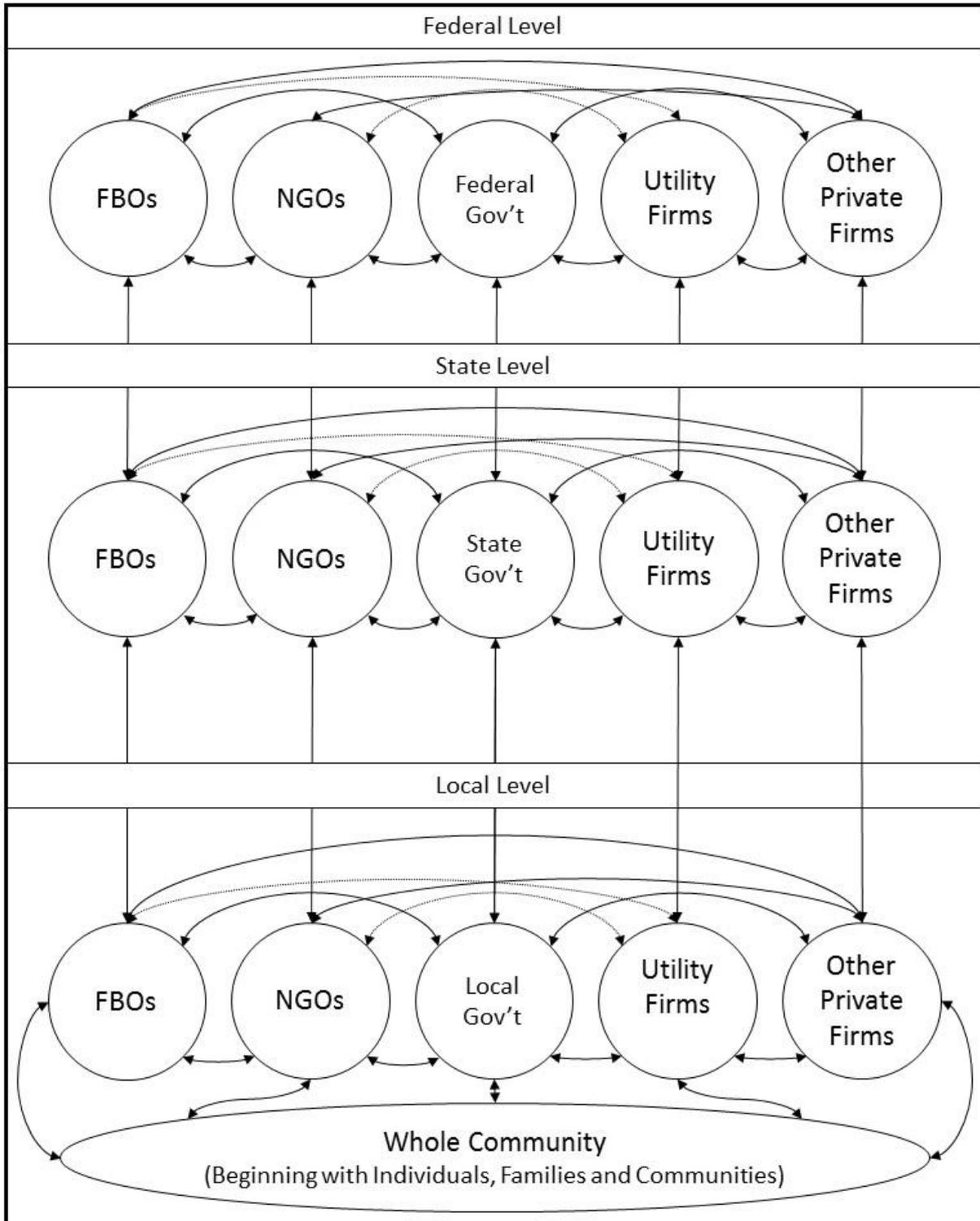
<i>Second-Order Themes</i> <b>First-Order Categories</b>	<b>Illustrative Quotes</b>
<i>1. Learning</i>	
A. Evaluation of successes and failures	<p>A1. The [long-term recovery groups] are all up and running... There are various different strengths that each one of them has. It's interesting because—and I wasn't here from the start—but what I've heard anecdotally and what I can see when I sit back and take a look is that some of the long-term recovery groups that received a lot of funds upfront are the ones that are struggling to move forward. (INF-005, NGO C)</p> <p>A2. It's funny, though, because I have the 100,000 foot level that I can look at things; every state, city, and town going through the same thing, they haven't come up with a—wouldn't it make sense to have the whole northeast region get together? And that's, I think, our biggest frustration. Let's have one set standard, whether it be New Jersey, Connecticut, Massachusetts. Here's where we're going; here's who has control. Even on the state levels, we're finding out that the local cities and towns don't play well in the sandbox. (INF-025, PSO N)</p>
B. Documentation of successes and failures	<p>B1. Because part of it is that there is this long history for [NGO association] but it's not documented anywhere so [individual] has been working hard to document the minutes of all the long-term recovery groups and the calls so that we can have some basis for what was the best practice so we don't have to redo it again. (INF-004, NGO C)</p> <p>B2. ...we are actually part of a consortium that deals with this very issue: [consortium]. And you're right, they're going to end up putting together millions of dollars' worth of books that sit on a shelf until something happens because there wasn't any kind of plan related to keeping that fresh. (INF-003, NGO B).</p>
C. Learning from successes and failures	<p>C1. I think it works well. It could work better. I think if another disaster was to hit we would be better prepared because everybody has a better idea what's going on. (INF-017, NGO I)</p> <p>C2. So we had to really scramble. And now, like I said earlier... if there is another storm, emergency declaration, our response will be even better. We've learned, it was a learning process. New Jersey never had a major disaster like this. So they learned, we learned, we worked together well. We're friends, companions, and hope we never have to do it again. (INF-006, NGO D)</p>
D. Diffusing learnings	<p>D1. [County] and [county] got hit much harder but have been much slower in getting the process going. [County] wasn't hit quite as hard but they have a really good system up there. So a lot of times we learn from what they're doing. (INF-017, NGO I)</p> <p>D2. The people that are most listening are the people that have gone through it. Florida, Houston. Guess what? They are like, "Yeah, we know it's going to happen but it's not going to happen to us." So they still have that mentality. It's going to happen to them. But those types of things and the more that we can learn those lessons. What we're doing internally, sharing those lessons along with our internal folks in other parts of the country. (INF-025, PSO N)</p>
<i>2. Regulating</i>	
E. Developing or updating 'hard' laws and regulation	<p>E1. FEMA is making these same kinds of judgments and they're struggling and grappling with these same kinds of issues where federal legislation is intended to be – it's got an intended audience. Most of the time, public entities, municipalities, towns, counties, states. They're not looking to help individual organizations out there. But at the same time, if that organization is a key to the resiliency or the ability of a community to recover more quickly than who are we kidding? And I'll be honest with you – Sandy taught us, also at the higher levels [of government]. (INF-019, GOV J)</p> <p>E2. All of [the volunteer] hosting is in churches. And we had issues with fire codes. So the [government agency] was a real big advocate with the state, in order to help get some modifications into local fire codes that would allow us to have volunteers stay in churches. (INF-008, NGO E)</p>

F. Developing or updating 'soft' laws and self-regulation	<p>F1. [The council] did an excellent job – they're developing what they call 'playbook'. So throughout the country, even after Katrina, there's no resource to go to in order to say to funders: "Guess what? They've found that people tend to pour money into disasters initially but as time goes by, there is still huge need." And it's need they didn't anticipate, like mental health needs. Nobody thought all these areas had to be addressed and there's no money for any of these areas. (INF-023, PSO M)</p> <p>F2. ...right now there's a big emphasis within the state ...on ensuring that starting with state agencies and then moving down the line to other entities, even major participants within the state in the private sector, have identified and developed and updated their business continuity plans... So what we're trying to do is institutionalize what may have happened in an ad hoc manner into something that can be planned and replicated and built on for any future event. (INF-019, GOV J)</p>
<i>3. Interconnecting</i>	
G. Developing stronger relationships with partners	<p>G1. With past disasters, I've recognized that working with our partners – [individual] and [individual] – that it has to be relationships. It has to be the inner working we've had with [NGO association], the faith-based, non-government for the long term. (INF-021, GOV K)</p> <p>G2. But there are a lot of changes. It's two-fold. Internally there's a big push for us to go out and become more interactive with the companies that we deal with as well as the community. But also government agencies, the whole regulatory thing... (INF-025, PSO N)</p>
H. Developing relationships with new actors	<p>H1. Well, we've had substantial outreach to what we call the big box retail group. ...the big warehouse stores where we've actually executed formal handshake [memorandums of understanding] to actually work together. A document that was signed by both organizations. We want to continue moving forward into other areas like the pharmacy, bottled waters. (INF-019, GOV J)</p> <p>H2. There is a litany of groups, not the least of which is volunteer organizations and we absolutely need to depend on them. So to answer your question, yes [our] network is expanding and it needs to continue to expand so that we have those resources; so we have that all-important one-to-one connectivity. And understanding what our abilities are; understanding what their abilities are. What they actually do and how they respond. Again, building the relationship. Relationships can never be overstated. (INF-026, PSO O)</p>
<i>4. Re-engineering</i>	
I. Creating new programs and processes	<p>I1. There wasn't any moment to even sleep. Afterwards we went to IBM and said, "Help us. We need a system to be able to dump all this data into and have it come out so that it makes sense to people over time." (INF-004, NGO C)</p> <p>I2. I see that happening with several of the government projects and programs that get rolled out. By the time it's set up, and is ready to run, the need has already outgrown the program, the way that it has been established. And it's a lot harder for government to shift gears. (INF-005, NGO C)</p>
J. Improving or adapting existing programs and processes	<p>J1. I think it's hard because they're also dealing with a lot. Like the [government agency] – they had a lot to keep busy before the storm hit so now they're suddenly having to tackle this whole program of buying out all these houses and then they kind of changed their rules. I don't know how much the programs that Trenton is running – how much they take in consideration how it affects the clients. I know they try to. (INF-017, NGO I)</p> <p>J2. So it's interesting because actually now that it's our second summer, we still don't really know what it's going to look like, but we're trying to be more organized about it, if that makes any sense at all. My favorite quote from someone, when I first started is: "we're building the train as it's hurling down the tracks". And I would have to agree and say that we're still doing that. (INF-016, NGO H)</p>

**FIGURE 1: Evolution of the National Preparedness System**



**FIGURE 2: The Preparedness System as a Social System**



**FIGURE 3: Grounded Model**

