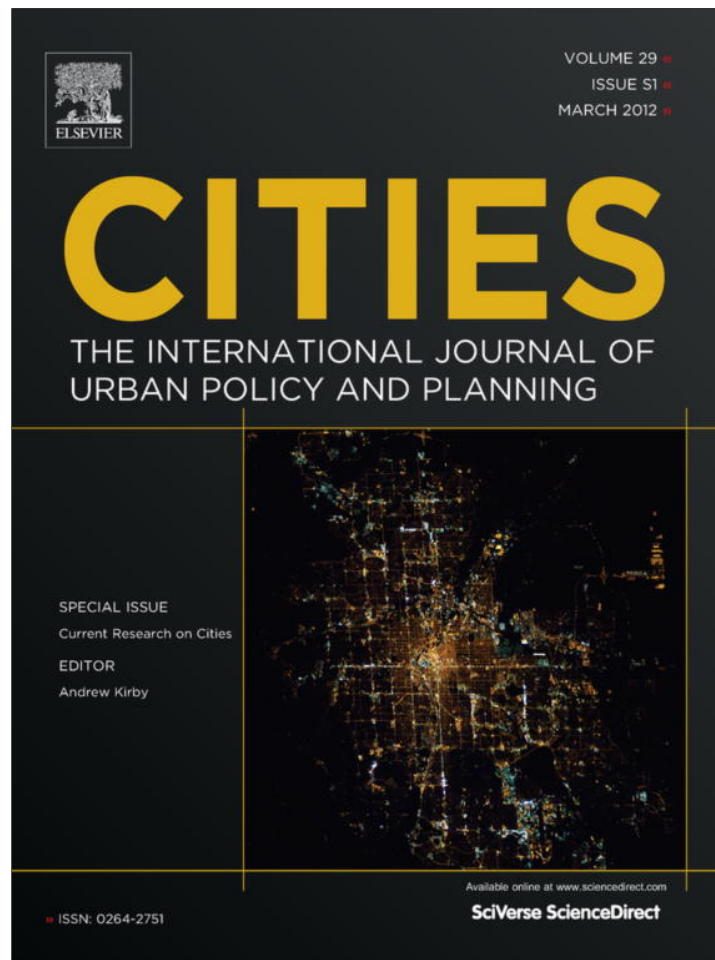


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Disaster and emergency management systems in urban areas

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ARTICLE INFO

Article history:

Available online 21 December 2011

Keywords:

Emergency management
Urban areas
Metropolitan emergency management
Collaborative emergency management

ABSTRACT

This article focuses on the factors shaping and constituting governance in urban/metropolitan emergency management. The main focus of the article is the multi-faceted inter-organizational relationships producing shared goals that are practiced at the local level, and specifically within the context of county-level metropolitan emergency management. The article presents a conceptual understanding of the governance concept, a brief summary of related research in the context of emergency management, and an example of the Orlando Metropolitan Area in the State of Florida for practical purposes.

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Introduction

The way public service is delivered today has dramatically changed over the last decades. While there has been a change in the range of actors delivering those services, the most important reform has been observed in the tools and forms of service delivery. Today public agencies are not the only providers of services that traditionally used to be or were considered 'public': non-profit and for-profit agencies as well as ordinary citizens have become the stakeholders and actors taking on the roles and responsibilities of service provision at all stages of the process. The notion that embraces the processes and activities of all those inter-dependent actors is known and advocated today as governance.

The term governance, by simplest definition, entails inter-sector and inter-governmental collaboration which delivers specific services to the citizens. Governance has become one of the main tools to address complex and multi-faceted societal issues today. One of such fields is emergency management, which has experienced substantial changes over the past years especially due to the increased impacts of disasters on the society. It is impossible to imagine emergency management today as a field comprising agencies acting on their own; governments at all levels seek and establish partnerships, whether formal or informal, to tackle issues of complex nature. This article briefly describes the notion of governance and how the concept is practiced in the field of emergency management in the context of urban/metropolitan environments. An example of the Orlando Metropolitan Area in the State of Florida is provided to show how governance has become an indispensable part of today's emergency management practices.

Disaster and emergency management in urban areas

The term governance has been used in the literature in several forms varying from collaborative governance to collaborative public management. While the nuances are there depending on the focus and of location of the issues addressed, the term governance coincides or overlaps the concept describing network relationships and partnership arrangements among several actors, representing different sectors and levels of government that come together to address a common goal and produce shared results. Specifically, it is a consensus-oriented and deliberative process (Ansell & Gash, 2007) with shared decision-making (Freeman & Peck, 2007) directed towards shaping and influencing a public policy (Klijn & Koppenjan, 2000).

Governance refers to the management of networks that are formed and maintained to solve complex problems (Peters & Pierre, 1998; Salamon, 2002). Governance networks require organizations to work collaboratively to solve common problems and reach convergent organizational goals. This may lead to fuzzy organizational boundaries (Stoker, 1998). Additionally, organizations operating in governance networks strengthen their connections with multiple relationships (Milward & Provan, 2000; Rhodes, 1996). Collaborative relationships are products of joined efforts for reaching common goals, combined resources, shared decision making, and accountability for final product (Kamensky, Burlin, & Abramson, 2004). In the simplest sense, collaboration is a set of activities directed towards the achievement of "common goals, often working across boundaries and in multi-sector and multi-actor relationships" (Agranoff & McGuire, 2003, p. 4).

Feiock (2004) argues that metropolitan governance today is in practice across many fields and disciplines, and existing research has focused only on competition, thus undermining the importance of cooperation. In fact, he claims, cooperation is a stronger aspect of metropolitan governance that researchers should focus

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on, which is the binding glue of all inter-organizational relationships at the metropolitan level. Ahrens and Rudolph (2006), in turn, argue that governance should be applied across all levels of government including community and local levels, with specific focus on the capacity-building of respective governments. Effective disaster management at these levels is argued to be possible through the implementation of governance elements including accountability, participation, predictability, and transparency. These aspects of governance should be the main factors shaping and determining inter-organizational relationships among the different sectors and levels of government. Overall, though, all these values and capacities should be the contributors to disaster resilient urban communities that, according to Pierce, Budd, and Lovrich (2011), should be able to absorb change-producing disturbances comprising including natural disasters and emergencies.

Networks and urban emergency management

Emergency management is historically collaborative. Since the beginning of 20th century, multi-sector collaboration was prevalent in the field (Kapucu, 2008; Rubin, 2007). The September 11 attacks showed the limits of government organizations in emergency management (Comfort, 2002). Public organizations from different levels of the government, private sector organizations, nonprofits, individuals and community organizations have been components of the emergency management system. However, there are distinctions between rural and urban environments which require different resources and knowledge in each setting. The complexity of urban settings requires; additional attention and a denser set of relationships between stakeholders of the emergency management mechanisms, more in depth analysis of conditions before, during, and after a disaster, and creates further complication in the decision making mechanism (Comfort & Kapucu, 2006; Petak, 1985). Citizens, advocacy groups, private organizations, nonprofits, and public organizations from various backgrounds are part of the system, which adds complexity while providing a larger amount of opportunities for public managers to use in effective management of emergencies (Kapucu & Ozerdem, 2011).

Comfort (2002) examines emergency management system through the lens of complex adaptive systems. Her approach requires a sound, appropriate, and flexible information infrastructure in maintaining organizational tasks. Information infrastructures and networks are critical to making timely decisions. Lack of information networks and a clear flow of information inevitably lead to the collapse of sense making (Weick, 1993). Complex systems also refer to emergent and self-organizing groups such as individual responders and nonprofits. Effective information sharing in times of disasters is critical for managing self-organizing groups and channeling them in the appropriate tasks. Complex systems embedded in cities, and the potential scope of emergent groups, during disasters draw significant attention to urban emergency management systems.

Citizen behavior and emergent groups are not limited to individual efforts in disaster response. Civic engagement and citizen initiatives have an important role in multiple aspects of managing emergencies in the metropolitan setting. They are not only involved in preparedness and response efforts, but also provide cash support and donate blood in the aftermath of catastrophes (Stallings & Quarantelli, 1985). For example, in the aftermath of the September 11 attacks, Kirlin and Kirlin (2002) noted that civic community makes three major contributions in response to terrorism. First, it establishes bridges between citizens and leaders which create the public judgment necessary for commitment to fight against terrorism and also other emergencies. Second, it

promotes listening, tolerance and diversity in ideas. Third, citizens are more involved in emergency management efforts.

Mushkatel and Weschler (1985) similarly state that the governance of emergency management should be shared across different levels of the government and among different sectors, thus, reducing the burden of any single agency. In turn, local and regional capacities should be enhanced, since it is mostly at this level that metropolitan emergency management is based and operates. Metropolitan emergency management is and should be an arena for inter-organizational arrangements directed towards the collaboration and coordination of disaster and emergency management activities. With overlapping claims, Andrew (2009) argues that the nature of inter-organizational networked governance is mostly the function of the characteristics of services and goods sought to be collaboratively delivered. Simo and Bies (2007) use the collaborative public management paradigm and cross-sector collaboration to examine role of nonprofits in Hurricane Katrina. They used Bryson, Crosby, and Stone (2006) framework for cross sector collaboration to examine the nonprofits' behavior in response to Katrina. In their research, they found that nonprofit involvement in cross-sector collaboration was critical particularly important when administrative failures were overwhelming and there were difficulties in meeting the daily needs of citizens during and after the disaster.

Waugh and Streib (2006) argue that governance in emergency management relies heavily on the local capacity, thus, emphasizing the role of communities and agencies in the metropolitan context. Similarly, Williams, Batho, and Russell (2000) point to the importance of local capacity building and related inter-organizational networks when analyzing the case of the June 1996 bombing in the City of Manchester, UK. Partnerships were instrumental in the ultimate success of emergency management during and after this disaster. Local capacity, however, is mostly concentrated within county-level governments (Waugh, 1994). Waugh (1994) argues that county-level metropolitan governance is the most suitable system for dealing with disasters, especially due to its proximity to sub-level and upper level government, a larger pool of resources, and the use of forums for inter-organizational arrangements at the local level. In addition, such mechanisms are clear of command-and-control structures and favor a more collaborative and cooperative perspective to disaster and emergency management (Kapucu & Ozerdem, 2011).

Beyond the above-mentioned conceptual discussion on metropolitan/urban governance in emergency management, several studies applied the concept to urban settings as well. Keil and Ali (2007), for example, examined the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak in Toronto, Canada, and analyze the factors that constitute urban governance today. Their research shows that human mobility is weaker than the mobility of pandemic diseases, which in turn causes significant threats to the public health. In these kinds of cases mobilizing all the necessary resources in a timely manner is critical, effective network management is a key aspect of this task.

The need to mobilize resources and experience has also proved evident in the implementation process. Based on the study of metropolitan homeland security, for example, Chenoweth and Clarke (2010) find that cities with advanced, multi-level and formal governance arrangements are more effective in terms of the implementation of specific DHS initiatives. Their study points to the importance of previous experience, in terms of collaborative practices, for producing more effective results. On the other hand, considering a study on the urban governance of emergency and disaster management of bushfires in Sydney, Australia, Gillen (2005) finds that emergency management governance is effective to the extent that it is inclusive and participatory. Accordingly, it is not only institutional arrangements but the extent to which

citizens are involved in the governance process that creates success. The author claims that resistance to collaborative approaches among related organizations as well as community stakeholders would result in non-resilient communities. [Godschalk \(2003\)](#) similarly argues that resilient cities are those with collaborative emergency management governance embracing all sectors and levels of government, proactive in nature, fostered by strong leadership, and based on continuous learning. The author claims that metropolitan emergency management governance is not an issue of one-step reforms but that of long-term efforts of continuous institutional adjustments for collaborative arrangements.

With a similar focus on the aspects constituting urban governance, [Tanner, Mitchell, Polack, and Guenther \(2009\)](#) examine the governance framework of 10 cities in Thailand, India, Vietnam, and China, evaluating them in regard to climate resilience. The authors assess the framework in terms of five parameters, namely (1) decentralization and autonomy of decision-making authority; (2) transparency and accountability of legal and financial issues; (3) citizen responsiveness and operational flexibility; (4) participation and inclusion of relevant stakeholders; and, (5) collaborative experience and technical as well as third-party support. The authors conclude that good urban governance, along with the quality of inter-organizational arrangements, is mostly characterized by the level of risk awareness and political will, resource availability, the existence of accountability mechanisms, and participatory planning.

Another related study by [Menoni \(2001\)](#) examined the case of the Kobe earthquake of 1995 in Japan, and looked at the relationships among the different factors affecting urban governance in emergency management. The author finds that it is not only the organizational or system-level technical factors that should be considered when dealing with disasters, but also the social aspects. In other words, it is important to make related practical adjustments based on socially emerging needs in times of disasters rather than ignoring them. A closely related study is by [Savitch \(2008\)](#), which focuses on terrorism in the context of cities and claims that urban environments possess two characteristics, namely vulnerability and resilience. The main claim of the author is that while cities are more vulnerable to man-made disasters like terrorism, resilience is the key factor in balancing the negative consequences, which is sustained through political order. Local resilience, thus, becomes an inherent and long-term condition of the urban areas.

In light of the literature review, several themes emerge on urban emergency management governance. First of all, there is a tendency to stress the collaborative approach when dealing with and responding to disasters. In other words, collaborative and networked relationships constitute the core of the urban/metropolitan emergency management. Multi-level, cross-sector, and inter-jurisdictional relationships are considered a must for today's urban emergency management governance. Secondly, these relationships are claimed to be effective only if the local capacity is strong and developed with all stakeholders ready in terms of the strategic and technical aspects. In a sense resilient urban communities are those that are prepared with enhanced capacity. Thirdly, there is an emphasis on leadership and political will that would create, foster and enhance an environment of cooperation rather than competition, especially due to the sensitivity of the emergency management context. Lastly, there is an intense stress on the characteristics of networked relationships, set apart by flexibility, transparency, participation, and accountability. These factors impact not only the effectiveness and efficiency, but also the legitimacy of the overall emergency management governance process.

Recent trends: collaborative emergency management

Urban/metropolitan emergency management governance today is the result of several changes and reforms over the last decades.

Related changes in this approach are described in the following sections, and lastly present a case for exemplification purposes. Collaborative governance has already become a wide practice across several fields of public administration. Emergency management is one of such fields relying on inter-sector and inter-governmental arrangements to effectively deal with emergencies and disasters ([Waugh & Streib, 2006](#)). This urge has been especially substantiated by the increased severity and scope of disasters, which has shown how government agencies responsible for responding to disasters are no longer capable of doing the job on their own ([Bier, 2006](#)). The complex issues so much inherent in emergency management become unmanageable with traditional tools characterized by hierarchical structures, rigid organizational boundaries and extensive red tape ([Kapucu, 2008](#); [Kapucu & Van Wart, 2006](#)). The overwhelming nature of disasters, bringing about uncertainty and complexity, makes it imperative to collaborate with other actors and stakeholders through collective decision-making and action ([Kapucu & Garayev, 2011](#)).

This trend in practice, however, is not only the result of environmental disasters. Collaborative emergency management has been on the rise over the last decades, especially because of policy changes implemented by the federal government that fostered reforms. Collaborative governance in the field is a result of several 20th century policy adjustments and historical events. The paradigm shift experienced can be summoned in the gradual transitions from non-involvement strategies to coordination policies and from coordination policies to collaborative governance. The former transition roughly covers the second half of the 20th century when the national government increased its presence through the establishment of the Federal Emergency Management Agency (FEMA) in 1979 and subsequent reforms to implement an all-hazard approach to emergency management. The main characteristic of this period was the focus on the use of governmental tools to tackle the problem of coordination in times of disasters.

The Federal Response Plan (FRP) created in 1992 was a move to re-organize the disaster response structure across the nation and to bring about standards implementable at the state and local levels. The standards entailed organizing emergency response around emergency support functions (ESFs) which aimed at grouping agencies in line with their expertise, operations and provisions. While the FRP was a national design describing how the federal government would act to support state and local efforts, it was modeled at the lower levels of government to standardize inter-governmental operations and coordination ([FEMA, 1992](#)). The FRP was replaced by a more comprehensive National Response Plan (NRP) in 2004 after the creation of the Department of Homeland Security in 2003. The NRP was a combination of all previous plans and strategies with a goal to fix inter-agency coordination and communication problems experienced during the September 11, 2001 terrorist attacks. The NRP came with a set of policy adjustments and standardizations which were embodied in the National Incident Management System (NIMS) envisioning a coordinated, unified and streamlined effort to deal with all types of disasters, and focusing on the capacity of collaborative arrangements between representatives of different sectors and levels of government. The inclusion of for-profit and non-profit sectors in the overall collaborative framework was an additional development to note ([DHS, 2008](#)).

Hurricane Katrina of 2005 was a test event that showed deficiencies in the new system, especially due to the highly criticized move of the national government to put FEMA under DHS's authority, making it less effective and less autonomous. Subsequent reforms resulted in the creation of the National Response Framework (NRF) in 2008 aiming to expand inter-agency relationships, increase in the number of actors, create better coordination, strengthened communication channels, and increase in flexibility.

Additional emphasis was placed on the importance of household preparedness, thus including citizens in the overall picture.

All of the three above mentioned documents were created with the main design being stable. Federal response was structured around ESFs for coordination purposes and the Incident Command System (ICS) of NIMS for operational effectiveness/efficiency purposes. While the FRP was designed around 12 ESFs, the NRP and NRF were designed around 15 ESFs, with an increased number of subordinate and support actors and more complex inter-organizational relationships.

Multi-level governance in metropolitan emergency management

The FRP, NRP, and NRF were documents establishing specific standards so that state and local governments could model and implement them at different levels and across organizational boundaries. State governments, as a general practice, replicated the federal plans with slight adjustments for contingencies related to localities. Accordingly, the state is an advocate of federal policies mandated to the lower levels for implementation purposes. Therefore, the main role of the state government is to monitor the implementation of federal policies at local levels. In addition, the state government is responsible for intervening when local capacity is overwhelmed in times of disasters. In such times, the state provides guidance, support and aid for local governments, especially in terms of resources. When state capacity is exhausted and a state of national emergency is declared, the federal government is expected to intervene and provide relevant support.

During times when disasters are coordinated between different levels of government the ESF-based structure is specifically important. The standardization of resource grouping as well as the responsibilities of actors leads to a more streamlined response and recovery process. Accordingly, an ESF responsible for mass care at the local level would coordinate with the same ESF at the state level, which in turn would contact the respective ESF at the federal level. One should not confuse the ESF-based coordination framework with the ICS-based operational template. The former aims at the clarification of roles and responsibilities, while the second aims to standardize operational procedures, concepts and oversight when responding to disasters.

An example: Orlando Metropolitan Area

When considering local governments, the emergency management response framework is similar, though there are more specifics and exceptions pertaining to localities. Since emergency management is mostly local, emergency management systems at the local level are designed in line with demographic background, community need, resource capacity, geographic characteristics and socio-economic elements. One of the most significant local government divisions in the United States is the county government; county emergency management plays a vital role in managing disasters as a subordinate level under the state government (Waugh, 1994). This article uses the Orlando Metropolitan Area (OMA) in the State of Florida as an example, to describe how metropolitan emergency management practices the governance concept.

As in most other states, the main authority and duty of emergency management in urban/metropolitan areas lies with the respective county government. In the case of OMA, it is Orange County that is responsible for preparing local sub-governments for disasters. Orange County has a population slightly exceeding one million and is a region incorporating twelve cities, with Orlando

being the most important city of the County. In accordance with the Florida Statutes Section 252.38, which requires all county governments to establish respective emergency management agencies, Orange County has delegated the authority of dealing with disasters to the Orange County Office of Emergency Management (OCOEM). The OCOEM is the main body coordinating disaster response, which is located and administered at the operational site of the Emergency Operations Center (EOC). The EOC is the hub for coordination of the local agencies responsible for disaster management varying from law enforcement and first responders to utilities management and military (CEMP, 2009).

As part of the mandate, the OCOEM has a Comprehensive Emergency Management Plan (CEMP) that specifies the roles and responsibilities of respondent agencies in times of disasters. The CEMP is a document that fosters rather than mandates inter-agency collaboration with the purpose of a more effective and efficient response; the participation of specified agencies in EOC operations is completely voluntary. Despite such autonomy, however, major respondent agencies come together under the umbrella of the EOC creating a coordinated and unified action. The EOC is designed in a way that groups certain ESFs under the ICS-based sections of operations, logistics, and planning and information. Each of the ESFs, in turn, consists of a primary agency that coordinates operations and support agencies that are called upon if/when the primary agency requests aid (CEMP, 2009). The CEMP groups all respondent agencies under twenty ESFs (See "Appendix A" for complete list).

The above-mentioned framework is a mechanism to initiate and coordinate collaborative practices among representatives of different levels of the government and sectors, with each having a duty in the overall emergency management process. It is important to note that the extent of actor involvement is very much related to the scope and severity of emergencies, this may result in a monitoring status, partial activation or full activation of the EOC. In addition, the OCOEM is in close relationship with the municipal offices of emergency management, including that of the City of Orlando. In this sense, the OMA emergency management is a governance of multi-level, inter-jurisdictional, and cross-sector collaborative networked relationships.

Because of its wide application in many counties across the United States, not quite common and developed in other countries, the ESF-based approach has become a tested standard for local governments. This standard was fostered and enhanced through FEMA's policies starting in 1990s, up until 2003 when it was augmented by ICS-based template. It is important to note that ICS-based approach was not offered as a reaction to the ESF-based framework, but to augment it by accounting for contingencies and providing a standardized operational guidance. Therefore, the ESF-based system still stands as a sophisticated and viable approach to deal with emergencies and disasters, and will be so until a more comprehensive and successful governance system is offered in practice.

Would the system be applicable or is there any similar practice or precedent in other contexts, or more specifically in other countries? A somehow similar approach, for example, is practiced by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), which envisions coordination of relief operations under nine clusters varying from logistics and communication to food and sheltering. Being a more universal and less fragile in nature, this cluster approach is very limited in terms of capacities and opportunities the ESF-based ICS template offers. One should note that the American system is more or less effective at the lower levels of governments, the community level, or local level, especially because of its ability to be flexible and manageable only at this level. Thus, the systems that would replicate the American approach should target its use mostly at the local level, where coordination is needed the most.

Table A1 (continued)

Organization name	ESF#1 transportation	ESF#2 communications	ESF#3 public works & engineering	ESF#4 firefighting & EMS	ESF#5 info & planning	ESF#6 mass care	ESF#7 resource support	ESF#8 health & medical	ESF#9 search & rescue	ESF#10 HazMat food & water	ESF#11 energy	ESF#12 military support	ESF#13 public information	ESF#14 volunteers & donations	ESF#15 enforcement & security	ESF#16 law enforcement	ESF#17 veterinary/animal protection	ESF#18 community and business	ESF#19 damage assessment	ESF#20 utilities
Orange County Animal Services Division																				
Orange County Business Development Division																				
Orange County Communications Division	S		S	S	S	S	S	S	S	S	S	S	P	S	S	S	S	S	S	S
Orange County Community and Environmental Management Department														S			P			
Orange County Convention Center																				
Orange County Corrections Department							S													
Orange County County Library Systems																				
Orange County Division of Information Technologies		P																		
Orange County Drug Free Community Office																				
Orange County Economic Trade and Tourism Development Division																				
Orange County Fire Rescue Department				P				S	P	P										
Orange County Fiscal and Business Services Division																				
Orange County Growth Management Department	S		S	S	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Orange County Health and Family Services Department																				
Orange County Human	S		S	S	S	S	S	S	S	S	S	S	S	P	S	S	S	S	S	S

Table A1 (continued)

Organization name	ESF#1 transportation	ESF#2 communications	ESF#3 public works & engineering	ESF#4 firefighting & EMS	ESF#5 info & planning	ESF#6 mass care	ESF#7 resource support	ESF#8 health & medical	ESF#9 search & rescue	ESF#10 HazMat	ESF#11 food & water	ESF#12 energy	ESF#13 military support	ESF#14 public information	ESF#15 volunteers & donations	ESF#16 law enforcement & security	ESF#17 veterinary/animal protection	ESF#18 community and business	ESF#19 damage assessment	ESF#20 utilities
Telephone Companies United Way Veterinary Medical Association VOAD		S				S											S			

Conclusion

This article presented a brief review of the literature on urban/metropolitan emergency management governance using the Orlando Metropolitan Area as an example. The literature suggests that urban/metropolitan emergency management today has become an arena for collaborative practices with a stress on local capacity building for effective results. Much of what happens at local level is an example of the multi-level networked governance of inter-organizational relationships directed towards a common goal in the context of emergency management. Investment into local capacity that would nurture networked governance oriented structures is important from practical point of view. Meanwhile, the way emergency management networks are shaped should be locality-specific and needs-based. Also emphasized is the need to apply and strengthen governance characteristics such as participation, flexibility, accountability and transparency in the context of urban/metropolitan emergency management.

Appendix A

See Table A1.

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