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# Disaster Preparedness and Resilience for Rural Communities

Naim Kapucu, Christopher V. Hawkins, and Fernando I. Rivera

It is critical to assess how the needs and vulnerabilities in rural communities impact the creation of resilience, especially in states that have a large expanse of rural regions. Rural areas present different opportunities and challenges from their urban counterparts for disaster managers. The position rural communities find themselves in after a disaster is different than that of urban communities. Using the Central Florida region as an example, this study examines the characteristics of disaster management in rural communities and ways to strengthen emergency management systems to develop and improve disaster resilience in these communities. Surveys and focus groups were conducted to examine the common traits and problems in existing emergency management systems across the rural regions. Results suggest that collaboration is needed in tackling evolving social, economic, and technological environments, which tend to create new vulnerabilities in rural communities. The adaptive capacity of rural communities is expected to sustain recovery at the individual, organizational, and the community levels. Sustainability is an important element for emergency management in rural communities because the policies and programs that influence the location and character of development can ultimately reduce losses and create resilience to future disasters.

**KEY WORDS:** emergency management, rural communities, capacity building, sustainability, networks, disaster resilience

# Introduction

The profession of emergency management has generated increased scholarly attention in the past few decades. There is much research on vulnerability in urban communities in the United States, but much less about how rural communities and their residents respond to natural and man-made hazards (Bankoff, Frerks, & Hilhorst, 2004; Brennan & Flint, 2007; Pelling, 2003). Compared to urban areas, rural communities may have a less diversified economic base and fewer financial resources to support disaster mitigation practices or rebuilding efforts (Janssen, 2006). Moreover, low population density and inadequate communication networks pose challenges particular to rural communities (Janssen, 2006; Oxfam America, 2009). In some cases, such as the four hurricanes that damaged portions of Florida in 2004 (Charley, Francis, Ivan, and Jeanne) and Hurricane Wilma and

Katrina in 2005 in the southeast, rural communities received limited media coverage and were at times in the periphery of large emergency response efforts (Brennan & Flint, 2007). Thus questions of how rural communities can reduce their vulnerabilities to disasters, improve their capacity to plan for major natural events, and manage post-disaster recovery and rebuilding efforts are particularly salient (Kapucu, Hawkins, & Rivera, 2013). This article focuses on addressing these questions.

One essential component of rural emergency management capacity lies in the ties and collaborative activities that are in place prior to disasters. It is through these linkages among individuals, government institutions, and nonprofit organizations that communities are able to effectively enter into the post-disaster recovery phase. Collaborative activities are essential for resilience—how well individuals and communities can adapt to changed conditions caused by disasters and the ability to maintain operations with enhanced processes geared toward future sustainability (National Research Council [NRC], 2009). Central Florida communities are the focus of this article. Weather patterns make many regions of Florida vulnerable to hurricanes, and droughts often produce wildfires, particularly in rural counties (Oxfam, 2009; Wisner, Blaike, Cannon, & Davis, 2004).

Compounding these risks is the fact that some portions of Central Florida have robust agricultural operations that are threatened by natural disasters. These issues are even more salient in rural areas where there may be more demands placed on local officials to respond to disasters, as rural communities might not have resources to properly coordinate actions across jurisdictions. Research suggests these communities tend to face more difficulties responding to disasters compared to more urbanized areas due to financial constraints and a lack of training and equipment (Janssen, 2006). The difficulties in developing comprehensive mitigation systems are amplified because of the geographic distances between rural and urban areas. Nevertheless, there are social and economic interactions with urban areas that have the potential to improve emergency management systems (Kapucu et al., 2013). The extent to which these relations influence resilience remains an important question with significant implications for how rural communities respond to disasters.

This article explores how rural communities can reduce vulnerabilities to disasters, develop the collaborative capacity to prepare and plan for natural disasters, and manage recovery and sustainable redevelopment efforts. More specifically, we focus on the structure of rural emergency management, in particular the practice of collaboration and capacity building for disaster resilience. In addition, the study explores differences between urban and rural communities in perceiving disaster resilience along with exploring obstacles to developing rural resilience and how this can influence future disaster polices.

## Literature Review

This section of the article provides a review of the literature on vulnerability challenges for emergency managers within rural communities, the importance of collaboration in building disaster resilience for rural communities, community capacity building for effective rural emergency management, and finally sustainable redevelopment perspectives in rural communities for disaster resilience.

#### Vulnerabilities to Disasters in Rural Communities

The potential risk of a disaster can begin to be analyzed by determining three pre-impact conditions: hazard exposure, physical vulnerability, and social vulnerability (Lindell, Prater, & Perry, 2007). A community's hazard exposure is determined by the geographical location of people and the events that threaten their lives. Physical vulnerability is comprised of human, agricultural, and structural vulnerability. The human and social aspects of vulnerability are highly complex. Social vulnerability is defined by Wisner et al. (2004) "as people's capacity to anticipate, cope with, resist and recover from the impacts of a natural hazard" (p. 11). The impact of a disaster can be social by stressing tensions among social groups, and psychological in nature that may be manifested as fatigue and depression. Research also suggests that disasters can have significant political ramifications that are spurred by individuals who share a common grievance to challenge their government about the handling of the recovery or the lack of mitigating action prior the disaster (Cutter, Mitchell, & Scott, 2000; Elliott & Macpherson, 2010; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008; Waugh, 2013).

Rural communities may be vulnerable due to lax mitigation practices because of a lack of local government capacity and fiscal resources from an un-diversified economic base. Furthermore, state and federal grants that are based on population size as a formula may be biased against rural communities, thus impacting their efforts to develop and implement hazard mitigation practices (Caruson & MacManus, 2008). The resource constraints of communities are more pronounced when considering infrastructure vulnerabilities. Antiquated public infrastructure is a source of vulnerability in smaller and more rural communities because these areas may lack the resources to rebuild or undertake recovery efforts that do not result in a large financial burden (Chang & Shinozuka, 2004). Moreover, older housing structures located in areas prone to disasters that are non-conforming to building codes are susceptible to long-term damage.

Elliott and Pais (2010) argue that the impact of a disaster and the redistribution of vulnerable populations in the recovery process vary by the urban or rural context in which a disaster occurs. Using data from Hurricane Andrew, they examine south Miami and southwest Louisiana to study the redistribution of vulnerable populations during the 8 years of recovery. Their findings suggest that the regional context (either urban or rural) moderates the environmental impact on the spatial distribution of locally vulnerable subpopulations during recovery. Their overall results suggest that changes in vulnerable subpopulations vary along the storm's path and that this variation differs by the type of disaster zone (displaced in urbanized areas or concentrated in less developed rural areas). Their findings also indicate that in more urbanized disaster zones long-term recovery displaces socially disadvantaged residents from the areas harder hit by the disaster. On the other hand, in a more rural disaster zone the long-term recovery concentrates on socially disadvantaged groups within areas harder hit by the disaster. The result is a concentration of social vulnerable populations, which may become detrimental for individuals and communities (Wilson, 1987).

#### Collaborations for Disaster Resilience in Rural Communities

Disasters are not confined to one particular jurisdiction. Thus it is a major goal of local emergency management officers to coordinate between agencies for response and recovery efforts. In order to accomplish this, emergency managers must confront the challenge of "anticipating the scope of damage" and bringing together multiple agencies from multiple jurisdictions (Kapucu & Ozerdem, 2013, p. 90). These relationships can be looked at as one of the more powerful tools in emergency management since "[c]ollaboration between actors is required in order to build resilience through effective disaster management policies," which can only be fulfilled through multi-agency cooperation (Ahrens & Rudolph, 2006, p. 217). Thus relationship building and partnerships are particularly critical for rural communities.

In the context of community disaster resilience, the relations among public, private, nonprofit organizations can be extensive. A challenge in developing resilient communities is not only recognizing and anticipating the scope of damages, but integrating multiple agencies, jurisdictions, and stakeholder groups in a response to a disaster (Comfort, 2006; Pelling, 2003; Ronan & Johnson, 2005; Waugh, 2013). Hazard preparedness should include strong coordination across federal, state, and local agencies with clear lines of responsibility. Thus regionalism and associated intergovernmental cooperation is another key component in assessing vulnerability (Caruson & MacManus, 2008; Kapucu, 2008).

When a disaster occurs, facilitating information flow provides choices and joint actions that enhance a community's capacity to respond more effectively. For example, Kapucu and Van Wart (2006) found that strong social relations amongst community members influence the timing of evacuation behavior. Moreover, as formal requirements from state and federal government units become more complex, emergency managers seek out advice from professional colleagues and peers. Such social ties are vital in emergency planning because they stimulate new ideas and create a support system that facilitates knowledge exchange (Dynes & Tierney, 1994; Elliott & Macpherson, 2010). Choi and Brower (2006) find that the accuracy of participants' collective network perception and knowledge of complete information systems (Kenis & Schneider, 1991), which are preferred by network managers, are key components in adequate planning for disasters.

The fields of public administration and planning recognize the limitation of bureaucratic systems and the need to develop and manage "networks" (Burby & May, 1998; Frederickson, 1999). This perspective focuses attention to the formal and informal arrangements and exchange relations among actors. Extant research has shown that the preparation and response behavior of key governing units to disasters is strongly tied to the patterns of relations among organizations within a network that influence the perceptions of stakeholder groups (Kapucu, 2008). Strong social

networks facilitate the quick flow of information and financial resources, which are critical for recovery and rebuilding efforts (Aldrich, 2012; Kage, 2013).

The collaboration with the private and nonprofit sector is also critical. For instance, supply and production chains, service delivery networks, and contract relationships with private organizations that are embedded in collaborative relationships are important to enhance resilience Nonprofits and other community organizations work in a similar fashion. They receive contracts from private and public agencies and serve individuals or other organizations before and after a disaster. Collaboration should be designed for meeting the needs of the community and should focus on improving interactions among collaborators.

#### Capacity Building for Disaster Resilience in Rural Communities

The capacity of communities is composed of four key factors. One of them is social capital that depicts the strong relationships and networks within the community. Community competence measured through problem solving strategies, skills, and flexibility is also an important factor in gauging the capacity of communities. Another essential part of community capacity is how information flows within the community and how communication infrastructure is designed and represented by trusted sources of information. The extent to which economic resources and risks are fairly distributed across the community is another factor that determines a community capacity building capacity. A high level of these four factors helps to develop community capacity building for disaster resilience, particularly rural ones (Aldrich, 2012; NRC, 2009; Norris et al., 2008; Waugh, 2013).

Among the attributes of local resources identified by Bruneau et al. (2003) that lead to increase capacity and community disaster resilience are robustness, redundancy, rapidity, and resourcefulness. First, robustness is defined as the "ability to withstand stress without suffering degradation" (Norris et al., 2008, p. 134). Robustness of resources also refers to the strength and quality of the resources, particularly under stress caused by disasters. Second, redundancy indicates the sustainability level of the resources and highlights the need for alternatives in the event of a disaster. Alternative resources can help a community maintain basic activities and remain functioning. For example, Cutter, Burton, and Emrich (2010) identify an abundance of evacuation routes, the capacities of shelters, and the capacities of hospitals as having a positive impact on disaster resilience. Third, Bruneau et al. (2003) defines rapidity as the "capacity to meet priorities and achieve goals in timely manner in order to contain losses and avoid future disruption" (p. 738). Fourth, resourcefulness is the ability to utilize human and physical resources to meet predetermined goals and priorities. A combination of these four attributes of resources provides the foundation of adaptive capacity in disaster management.

Cutter et al. (2008), for example, explain adaptive capacity using the example of floods as the focal point of the discussion. When a community faces this type of event more frequently, the community will learn how to adapt to new conditions and spend more resources and efforts preparing for future disasters. This process of learning how to cope with the changing scope of threats can take place at the individual level,

organizational level, and the community level. Individual level learning is generally about an individual's own experience. According to Mahler (1997), "individual learning becomes organizational when these lessons are institutionalized, making them available to other members" (p. 86). The structure and culture of an organization are also critical in learning process. For example the attitudes of managers and how they utilize and share information can determine learning success (Kraatz, 1998; Moynihan & Landuyt, 2009). As we see in the literature that rural communities can benefit from improved adaptive capacity by increasing individual learning and institutional knowledge of disaster response.

There are different resources noted in the literature that are considered necessary components of disaster resilience. Commonly mentioned resources are organizational capacity, economic and physical capacity, social capacity, community competence, and information and communication (Brody, Kang, & Bernhardt, 2010; Cutter et al., 2010; Longstaff, Armstrong, Perrin, Parker, & Hidek, 2010; Norris et al., 2008; Paton, 2007; Sherreib, Norris, & Galea, 2010). In terms of disaster research, resilience refers to the capacity to bounce back or bounce forward after a stressor event in a community (Godschalk, 2003; Longstaff et al., 2010). Kapucu et al. (2013, p. 357) argue that disaster resilience is "the ability to adapt through the redevelopment of the community in ways that reflect the community's values, and goals, and its evolving understanding of external forces with which it must contend." It is also the process of linking and managing the capacities in a community and adding adaptability features to these capacities (Norris et al., 2008). When examining community disaster resilience, Boin, Comfort, and Demchak (2010) consider community as a system and they define resilience as "the capacity of a social system (e.g., an organization, city, or society) to proactively adapt to and recover from disturbances that are perceived within the system to fall outside the range of normal and expected disturbances" (p. 9). The structure of social networks represents a measure of resilient communities (Pelling, 2003), and can be used to assess the vulnerability of rural communities to disasters and the role of intergovernmental relations in planning for, responding to and recovering from disasters.

Preparedness and mitigation at the community and individual level is also a vital component of disaster resilience. Federal initiatives in the United States, such as Presidential Policy Directive-8, aim to encourage and strengthen local planning efforts. Preseason alerting, marketing disaster plans to the public, community trainings and exercises, and first aid certification are some of the strategies for local governments that contribute to public preparedness. Disaster insurance for households and businesses, Citizen Corps, and Storm Ready Communities are other initiatives that urge people to take individual disaster precautions (Cutter et al., 2010; Godschalk, 2003).

#### Sustainability for Disaster Resilience in Rural Communities

Although, perhaps not explicit, the term resilience is often used within the context of sustainability,

particularly with regards to policies that are closely linked with reducing vulnera bility and hazards (Berke & Beatley, 1997; Burby, 1998; Weber, 2003).

Sustainability is an important concept for the natural hazards field because policies and programs that influence the location and character of development can ultimately reduce losses from hazards and provide long-term community benefits (Berke, 1995). However, noting the relative increase in lives lost from natural hazards, Berke (1995) suggests that "too often, institutional and policy changes that could integrate sustainable-development measures to prevent or reduce future loss and human suffering are not made before a disaster or during rebuilding" (p. 370).

In the context of natural hazards reduction, Berke (1995, p. 375) argues that sustainable-development can be defined as a process of development that achieves five main goals: (i) long-term economic development, (ii) health and safety through a recognition that natural hazards pose an ecological limit to development, (iii) distributional equity for current and future generations, (iv) accountability of individuals (and communities) that impose harms on others, and (v) participation of all interest groups affected by pre-disaster planning and post-disaster recovery initiatives.

The non-environmental components of sustainable-development are especially important in hazards and vulnerability assessments and in building resilient communities. Cutter et al. (2000) indicate that the less educated, those in poverty, and minority groups are often most vulnerable to hazards. Sustainable-development, in part, focuses on improving economic opportunities and greater participation in decision making for these groups. One argument for integrating sustainabledevelopment practices with hazards planning and vulnerability assessment is an improved standard of living and presumably a decrease in exposures to hazards (Berke, 1995; Burby, 2003). Although there are multiple units of government that are responsible for minimizing vulnerability, local governments are highly engaged in implementation and thus should focus on integrating sustainable-development measures into natural hazards planning (Berke, 1995; Haddow & Bullock, 2006; Lee & Mossberger, 2009; Tobin, 1999; Waugh, 1985). However, the lack of focus on mitigation planning is due, in part, to the low priority it is often given within the majority of communities (Burby, 2005, 2006).

Planning is largely processes oriented and participatory in nature. Tobin (1999) argues that sustainable and resilient communities should be able to withstand extreme geophysical processes and recover rapidly from disasters whenever they occur. It is suggested, therefore, that local planning for sustainability and resilience must be ongoing and include a high level of support from responsible agencies and political leaders. Moreover, planning should be based on partnerships and cooperation among different levels of government and focus on strengthening networks among interdependent segments of society.

#### Research Strategy

## Study Area

Central Florida is the focus of this study and is relevant due to the fact that much of the land in the region remains rural (Figure 1). Within the Central Florida region



Figure 1. Map of Central Florida Counties (MapWise, 2013).

there are 87 rural communities (U.S. Census Bureau, 2010), the majority of which handle disaster response operations through volunteers. These communities are especially vulnerable to hurricanes and wildfires. Geographic distances among communities may create difficulties in preparing and developing comprehensive mitigation systems (Oxfam, 2009; 2004). Rural communities tend to face more difficulties responding to disasters compared to more urbanized areas due to financial constraints and a lack of training and equipment (Janssen, 2006). Similar to many rural regions across the county, there are social and economic interactions with urban areas (Kapucu et al., 2013). The extent to which these relations influence resilience remains an important question with significant implications for how rural communities respond to disasters.

#### Data Collection

Our strategy for exploring rural emergency management practices is twofold. First, we collected data through a mail and online survey of emergency management professionals in eight Central Florida counties. Central Florida houses approximately 2.2 million people, which is nearly 12 percent of the total population of the state (MOEDC, n.d.). The region is also comprised of a diverse mix of heavily urbanized and rural communities, with some exhibiting characteristics of both Similar to other parts of the state, Central Florida is susceptible to various types of natural and man-made disasters including, but not limited to hurricanes, tornadoes, wildfires, and floods.

The purpose of the survey was to identify the communication, coordination, and resource sharing procedures among organizations involved in emergency management within Central Florida. The survey instrument also included questions on mitigation strategies, planning, preparedness, response, recovery, partnerships, organizational capacity, and demographic information. Results for close-ended questions were in the form of a five item Likert scale (e.g., 1 being strongly disagree to 5 being strongly agree).

After the survey questionnaire was prepared, it was sent out for review to a panel of experts consisting of 25 organizations representing each county (two to three organizations per county). The panel of experts included emergency managers of study counties and organizations that emergency managers recommended to include in the panel. The survey was subsequently revised based on the panel recommendations. County emergency managers assisted in administration of the survey except three counties (Lake, Flagler, and Levy). Emergency managers of these counties did not want to participate in this survey. Emergency managers of the remaining eight counties shared the survey with the organizations they listed in their Comprehensive Emergency Management Plan (CEMP) as having either a primary or secondary role in disaster response.

The survey was also given to organizations as a hard copy in focus group meetings. The administration of the survey started on August 19, 2011 and ended on January 20, 2012. This time frame covers approximately 3 months before and after the Atlantic hurricane season. In total, 242 organizations responded to the survey, which accounts for a 38.0 percent response rate. After eliminating responses in surveys with too many missing variables, the useful response rate fell to 25.2 percent. Our second data collection effort involved conducting focus groups in five rural counties (Brevard, Lake, Osceola, Sumter, and Volusia) and two urban counties (Orange and Seminole) between November 2011 and March 2012. We were not able to conduct focus groups in Citrus, Flagler, Levy, and Marion counties. These counties include rural and urban communities. The aim of conducting these focus groups was to understand the unique challenges faced by counties in building their emergency management capacity. Focus groups were conducted with only people representing agencies from one county. Participants were not mixed from different counties in the focus groups. Focus group participants included citizen groups, nonprofit organizations, faith-based community organizations, emergency management agencies, and business representatives. Recruitment of participants was done by contacting organizations listed in the county comprehensive emergency management plans.

For each county, we asked emergency management organizations and community representatives from nine emergency support functions to participate: transportation, infrastructure, first responders, information, health care, support, food and water, utilities, and communications. An interview guide was designed to explore the following themes: mitigation/preparedness/response/recovery, community vulnerability and disaster resilience, community relations and adaptation, social media/news media, politics and government action, and special need populations. The number of participants for each focus group ranged from 5 to 13. The interviews were conducted at an agreed upon location convenient to the participants and lasted on average between 1 and 2 hours. The focus groups were facilitated by the authors of this study, and were later transcribed verbatim by a member of the research team. A total of 60 individuals, representing 20 unique organizations, participated in the focus groups.

#### Results

There were a wide variety of organizations and participants that responded to the survey. Of the 242 respondents, on average half were the organization identified as the primary Emergency Support Function (ESF) contact, with the remainder being individuals given the responsibility of "standing in" for other members. Participating organizations included members of County Emergency Management and Sherriff Departments, Municipal Fire Departments, County Health Departments, Hospitals, Radio Services, Airports, and School Boards. The representatives were at different levels in their agencies. But we can consider them at the same level in terms of their responsibilities in regards to emergency management. We analyzed the interorganizational collaborative activities from the survey based on: disaster preparation, interorganizational networks, organizational capacity, mitigation activities, and adaptive capacity. Subsequently, we report results on rural and urban communities' differences in perceiving disaster resilience, as well as obstacles to disaster resilience.

To validate the survey responses, we asked participants to identify how familiar they were with the local emergency management operations they were referencing: 54.1 percent stated they were "very familiar" with their local operations while 40.5 percent were "familiar". Of the respondents, 7.2 percent have been in the field for 30 years, 11.7 percent for 20 years, 43.2 percent for 10 years and 18.9 percent for 5 years, only 9.9 percent of respondents have been in the emergency management field for less than 1 year.

# Disaster Preparation and Mitigation Activities for Rural Disaster Resilience

With regards to preparedness activities, 39.2 percent of respondents strongly agree while 49.7 percent agree that pre-season coordination meetings are conducted with local community organizations. However, questions regarding training and exercise programs within the community, and marketing relevant parts of the emergency management plan, have a more dispersed range with a majority

answering agree. These findings may highlight a need to bring more community focused events to the pre-planning level.

To assess mitigation activities, participants were asked the extent to which they are aware of the hazards that create a high level of risk for the community. Nearly 60 percent of the respondents noted "Strongly Agree," while 54.7 percent of the respondents indicated "agree" that they are aware of their own vulnerabilities; and 49.6 percent of the respondents indicated "strongly agree" that they have plan to reduce these specific vulnerabilities. When participants were asked to assess statements regarding response effectiveness, the data indicates most "Strongly Agree" that their organization takes part in practices that raise the awareness of partners for response (54.4 percent), improve the organization's ability to implement response disaster plans (59.2 percent), are oriented towards flexible response practices (52.8 percent) and bolster response practices by clearly defining responsibilities of partners (52.4 percent).

#### Collaborative Networks for Disaster Resilience

Looking more closely at the interorganizational networks formed for emergency management operations within each county, most respondents agree with the importance of partnerships, with 56.3 percent strongly agreeing that their organization participated in partnerships for disaster management. Approximately 42 percent indicated that they strongly agree that their organization shares resources to meet disaster response and recovery goals. More than 50 percent of the respondents indicated that they periodically contact each other to sustain their relationships. It is clear from these responses the tremendous value placed on creating and sustaining partnerships both prior to and after a disaster.

## Community Capacity for Disaster Resilience

In an attempt to assess the general organizational capacity, participants were asked questions related to the level of involvement of top level management in the following: supporting E.M. efforts, successful implementation of a plan during a disaster, learning about problems by assessing previous disasters, new knowledge generated after a disaster, and the application of this knowledge to improving emergency management operations. The response of "agree" or "strongly agree" ranged from 70 to 75 percent for all participants.

To examine adaptive capacity we collected information through questions that focused on the organization of the survey respondent. Participants were asked to assess from "Strongly Agree to Strongly Disagree" capabilities such as having adequate substitute resources (53.2 percent "Agree" and 20.6 percent "Strongly Agree"), and having an alternate location for operations in the event of a disaster (47.2 percent "Agree" and 3.1 percent "Disagree"). On the other hand, when asked if their organization has the capacity to utilize material and human resources, only 36.8 percent of participants indicated "Strongly Agree" while the majority (53.6 percent) answered "Agree". Indicators in this set of survey questions did provide more varied answers than those previously discussed, but most respondents gravitated towards "Agree" for questions regarding the ability to rapidly mobilize resources and capacity to utilize materials to manage disasters. These results suggest there is likely room for improvement in devoting resources to improve adaptive capacity, specifically in disaster management for rural communities.

# Perceiving Disaster Resilience

We utilized primarily open-ended questions from the survey and from the focus groups to highlight the differences and similarities between urban and rural communities in how respondents define "resilience." When asked to define resilience, most respondents, regardless of their characteristics such as years in the emergency management profession, feel that "recovery" is the concept that best describes resilience, with 23 percent of urban respondents and 22 percent of rural respondents noting this description. "Bounce Back" was noted by rural and urban communities (16 percent for each). "Normal" closely follows with 16 percent of urban respondents and 17 percent of rural respondents choosing this option. The fourth most chosen option by urban and rural communities in defining resilience was "Time," which received 16 percent and 13 percent respectively, while "prepare" was identified by10 percent of urban respondents and 12 percent of rural respondents. "Respond" was chosen equally at 10 percent by both groups of participants along with "Continuity" at 6 percent. "Restore" and "Avoid" was noted the least by urban respondents answering 3 percent and 6 percent respectively, and rural respondents answering 0 and 4 percent, respectively.

Other terms used to define resilience include continuity of operations or continuity of government. The ability to "muster resources" before, during and after an event was also discussed. A majority of participants commented on the aspect of having operations in place that allow for the continuation of critical daily functions. Pre-planning, policies and procedures already in place were also identified as factors of resilience to participants. This part of the survey was important to gauge the level of understanding and knowledge about resilience amongst both rural and urban community representatives. No major differences were noted between the urban and rural community perceptions. From a policy making standpoint it is clear that both urban and rural communities understand the importance of resilience and how to emergency management resilience.

#### Challenges for Rural Disaster Resilience

We also sought to ascertain whether there is a perceived difference in the obstacles that may hinder disaster resilience. For both urban (33 percent) and rural practitioners (51 percent) "Funding" was the highest perceived obstacle. This was followed by "Apathy/Complacency" with urban respondents choosing this obstacle at the rate of 29 percent, and 23 percent for rural respondents. For urban respondents, the economy was identified by 13 percent of the respondents, whereas no rural respondent noted this as a barrier. This may be a reflection of the fact that

rural communities often have fewer resources to begin with than their urban counterparts. Urban communities find "Communication" a more pronounced issue receiving 8 percent while time falls to 4 percent. On the other hand, 6 percent of the respondents of rural areas find "Time" to be a bigger issue with "Communication" receiving only 4 percent. Thus, despite the differences in vulnerabilities and risks in rural and urban communities, the major obstacle in both communities is funding.

Considering the obstacles that were highlighted in focus group discussions and open-ended survey questions, one practitioner defined issues in "just meeting your everyday needs and day to day operations" in which, "if you're (an organization) having struggles with those, then going beyond and trying to prepare for... 'a disaster and being'... able to bounce back when some of those assets are gone makes it a lot tougher." This brings attention to the common held assumption that organizations in rural communities face an ongoing struggle to maintain daily operations, even in non-disaster times. As a result a disaster can simply be overwhelming for organizations in rural communities. Another practitioner highlights issues regarding the economic base of a rural community by stating "in the long-term if you lose a significant core function" such as agriculture, "it is more difficult to recover." Rural communities have also identified that the effects of disasters, "spread throughout the community a lot quicker" because of the reliance citizens have on one another while on the other hand fragmentation is also stated as a problem. For urban counterparts the obstacles to disaster resilience include a lack of interorganizational training, and reliance on the government. One member stated that looking to the government for help has "become a way of life for us; to look to government to take care of people" which leads to issues of serving large and possibly unmanageable populations. It was stated by one focus group participant that urban communities have a "plethora of at-risk populations out there," the needs of which must be addressed in times of disasters. On the other hand, it was suggested that "there are segments of our community that really don't want to be recognized, and they're very apprehensive about the government," which leads to another road block in preparing and recovering from disasters.

# Discussions

Funding based on population characteristics can limit resources available to rural communities, which can affect the economic base and individual assistance, as well as fragment certain groups of the population. One Florida professional stated that "Florida communities that have been hit so hard in the economic crisis, we've cut our resources so much until some of the basic resources that provide the infrastructure needed to provide ... resilience are no longer accessible." Dispersed communities mean relief arrives to different areas at different times leaving some waiting for additional response and relief provisions. Migrant populations were identified in the focus groups as being vulnerable because of their apprehension to government officials and the anonymous nature of their communities. Therefore, it can be stated that culture and the exclusion of some social networks from support systems can place certain populations at risk in rurally dispersed areas. It is these social systems in place that create demographic and geographic specific social vulnerabilities that must be considered in order to approach resilience from the whole community perspective.

Dispersed populations, income level, and race play a key factor in the strength of a community. Citizens that have limited English proficiency are identified as vulnerability for both rural and urban counties. One practitioner states that, for example, "there probably is language challenges, and I don't know that we always do a great job of getting information out to that population." This response highlights a need for increased citizen engagement. The use of social media, websites and mobile phone applications may help local governments reach more vulnerable populations as these practices are becoming more popular.

Research for emergency management practices has presented a need to more closely examine the differences faced in specific geographical locations as way to strengthen regions and utilize a whole community approach to disaster resilience. It was stated that "the space between people and the ability to notify other people that there is something wrong becomes a problem in a rural area", in contrast to the closeness and accessibility experienced in urban communities. As a result, rural communities must find ways to increase information sharing and dissemination across a dispersed population. Capacity building and increased knowledge can become key components to increasing interorganizational relations in all phases of disaster management. A representative of an organization working in an urban community states that "part of our mission is to ensure that the community prepares themselves … [e]specially in rural communities, … because in many cases, the formalized response element isn't as robust, so they're really going to have to rely on each other ….. to be able to help 'rural communities' sustain and recover from a disaster."

The results suggest that value is placed on creating and sustaining partnerships. We can begin to correlate how the processes of establishing these networks can create a more disaster resilient community by increasing the adaptive and organizational capacities of rural agencies involved in disaster management. Funding and time are identified as being some of the most significant roadblocks to effective emergency management operations. These issues not only affect the adaptive and organizational capacity of rural communities, but also leave them in a position of not being able to fully manage the resources that may be available. Without proper training and interaction with multiple partners (which can be done through the inclusion of multi-agency and multi-jurisdictional agencies) officials will not only mismanage resources but may not visualize their full potential as well. Addressing the problems of funding and time through the use of multi-purposeful trainings will in turn increase the organization's capacity to utilize material and human resources, thus contributing to long-term resilience and the effective utilization of partnerships.

Having a certain level of reliance on and interaction between partner agencies helps strengthen everyday operations by encouraging the growth of new partnerships, as well as presenting specific community needs to others who may have the resources to help build the capacity of an organization. This study also highlights the use of preparedness and mitigation activities as a way of decreasing not only the geographical vulnerabilities, but also those created for citizens within the community. Communities that have a heavy reliance on agriculture tend to be more dispersed geographically, as a result the time it takes to relay information increases. Another problem faced in farming communities is their reliance on the crop as well as each other; this creates a chain reaction when one area incurs damage. Agriculture production also brings migrant workers and creates pockets or areas of the community that are dispersed, under the radar, and already in need of economic assistance. These areas or communities within the County then become highly vulnerable to the effects of a disaster creating a heavier burden of reliance on government interventions. Increasing pre-planning and mitigation efforts along with the inter-agency and cross-jurisdictional approaches may help rural communities' better plan and prepare for these unique circumstances.

Rural areas, in particular, need to approach disaster management from the viewpoint of creating and sustaining partnerships and building organizational capacity to carry them through mitigation, pre-planning and response to an efficient recovery status. This is critical as the economic base in rural areas if often defined by the ability to sustain agriculture activities, which can quickly become disabled after a disaster. Reaching out and extending community partnerships will be a key component to disaster resilience for the whole community. Enhancing the partnerships between urban and rural communities will help increase resources and resilience in the rural setting. Realizing this need prior to a disaster, for example in the pre-planning phase by utilizing group trainings and exercises, can increase the effectiveness of partnerships in the response and recovery phase. The research highlights a need for agencies across geographical and jurisdictional boundaries to work together to reduce hazards and vulnerabilities. Shared resources between rural and urban communities are found to be a key component in reducing vulnerability and increasing recovery time. The issue of not having redundant resources is a problem for rural communities and was identified in focus groups because, the "large mass of land and so many agencies that you're dealing with" cause dispersion of services and limit the ability to respond in an efficient manner.

# Conclusion

This study analyzed data collected from seven central Florida counties to examine rural communities and their emergency management practices, focusing on the structure of rural emergency management operations, the practice of collaborative emergency management practices, community capacity building, as well as the potential impacts these practices have on disaster resilience. In addition, the study explored differences between urban and rural communities in perceiving disaster resilience, and the obstacles to rural resilience. Our results indicate that understanding the needs, concerns, and perceptions of emergency management professionals and partner agency representatives helps better define future areas of focus for researchers and possibly offer strengthening techniques for officials. For instance, the results indicate the emergency management challenges of rural communities, such as a lack of funding, lack of training opportunities, and the capacity to manage potential resources, reliance on agriculture as the main economic base, and problems with timely communication to citizens and partners can be overwhelming when considering the limited resources in place. The study results also suggest that one avenue for building capacity is through the development of interorganizational networks. Indeed, our results indicate the tremendous value respondent's placed on creating and sustaining partnerships both prior to and after a disaster. This result is important as interorganizational relations strengthen the capacity to deal with emergencies, enhance partnerships in place to increase the reach of limited resources and encourage resilience to disasters for rural communities.

Our study does not come without limitations. The low survey response rate means that we are unable to generalize the findings to the whole Central Florida region. In addition, our study results do not represent the full gamut of organizations and groups involved in emergency management in the region. Even with these limitations the study results show the importance of understanding the needs, concerns, and perceptions of emergency management professionals, their partnerships, preparedness and mitigations efforts, as well as the identification of needs particular to rural areas. It is vital to understand these issues in order to successfully build disaster resilient communities.

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