

Understanding Multi-Sector Stakeholder Value Dynamics in Hurricane Michael to Facilitate Collaborative Decision Making in Disaster Contexts

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ABSTRACT

Despite the broader acknowledgement of shared responsibilities in emergency management, one of the hidden and overlooked issues in disaster literature is the integration of multi-sector stakeholder values: the things that are of importance to the stakeholders (e.g., safety, profit, electability). Stakeholders (e.g., different levels of government, the private sector, the non-profit sector, and the communities) hold numerous values with varying degrees of importance, forming a system of value priorities. Stakeholder values and value priorities—referred to as value systems—are not static in a disaster context; they are dynamic, time-sensitive, and event-driven. A more in-depth understanding of the dynamics of stakeholder value systems is surely needed to allow policy-makers to introduce more pro-active and timely measures towards more resilient communities. To address this need, this paper focuses on identifying and understanding the stakeholder values in the context of Hurricane Michael. Semi-structured interviews (n=24 with 30 interviewees) were conducted to understand what public and private stakeholders value in different phases of Hurricane Michael. Based on the interview results, ten stakeholder values were identified: safety, resource efficiency, natural resource preservation, culture preservation, community growth, community adaptability, community cohesion, social welfare improvement, personal achievement, and business development. This study advances the knowledge in the area of disasters by empirically investigating public and private stakeholder values across different phases of the disaster. Such knowledge will help practitioners implement disaster resilience strategies in a way that accounts for diverse stakeholder needs and priorities, thus facilitating human-centered decision making towards building more resilient communities.

INTRODUCTION

In the 2017 Hurricane Season After-Action Report, the Federal Emergency Management Agency (FEMA) stated that “the work of emergency management does not belong just to FEMA; it is the responsibility of the whole community, governments, private sector partners, and private citizens to build collective capacity and prepare for the disasters we will inevitably face” (FEMA 2018). Despite the broader acknowledgment of shared responsibilities in emergency management, one of the overlooked issues in the literature on disasters is the integration of multi-sector stakeholder values. Stakeholders are defined as any individuals, groups or organizations that are responsible for, impacted by, or interested in disaster management, such as different levels of government, the private sector, the non-governmental organizations (NGOs), and the community residents. Stakeholder values are the things that are of importance, merit, and

utilities to the stakeholders (Zhang and El-Gohary 2016).

Research shows that major life events could potentially impact individuals' value systems (Tormos et al. 2017). Disasters, as a devastating experience to most of the impacted people, could potentially alter ones' value systems. People's values could change at different phases of disasters, including disaster preparedness, response, and recovery. Having an in-depth understanding of the stakeholders' value systems is crucial for the decision-makers to introduce and implement different strategies and practices in a way that addresses stakeholders' prioritized concerns and needs.

Despite the importance, there is a lack of empirical studies that explicitly and systematically understand stakeholder values in the disaster contexts. There is also little research that examines how stakeholder value systems change in the immediate aftermath of disasters and with the time elapsing after the disasters. Many research efforts (e.g. Kapucu and Garayev 2011) have emphasized the importance of engaging multi-sector stakeholders and building collaborative efforts in disaster management processes, but these studies have not explicitly captured or integrated stakeholder value systems with disaster management. In addition, existing research (e.g., Hitlin and Piliavin 2004) has mainly focused on examining socioeconomic or demographic variables (e.g., gender, poverty, unemployment) as antecedents of individuals' value priorities. However, contextual variables (e.g., the disaster context) may be just as important to consider in understanding value priorities and their potential changes over time thoroughly.

To address the above-mentioned gaps, this study aims to understand multi-sector stakeholder values in the context of Hurricane Michael. Hurricane Michael is a category-five hurricane that made landfall in Florida's northwest Panhandle region on Oct 10, 2018. With 161 mph winds at landfall, it was the strongest storm that made landfall in the contiguous U.S. in more than 25 years. It caused tremendous destruction, a life-threatening storm surge, and extensive structural damage. Approximately 50,000 structures were damaged, and more than 3,000 structures were completely destroyed (NWS 2018). This paper presents an empirical study based on interviews with public and private stakeholders in communities that were heavily impacted by Hurricane Michael in the Florida Panhandle area. The remainder of the paper provides a brief overview of the research background, describes the research question, explains the research methodology, and presents our results and analysis.

SCHWARTZ'S THEORY OF BASIC HUMAN VALUES

According to Schwartz's Theory of Basic Values (Schwartz 2012), values are the things that are of importance to human beings. Each individual holds numerous values (e.g., achievement, security, benevolence) with varying degrees of importance. A specific value may be very important to one person but unimportant to another. Schwartz also identified three main features of values (Schwartz 2012):

- (1) *Desirable goals* – Values refer to desirable goals that motivate actions and decision-making processes. For example, a community resident who values their property's safety would install hurricane shutters during the disaster preparedness phase.
- (2) *Importance* – Multiple values are ordered by importance relative to one another to form a system of value priorities. Different people have different systems of value priorities. For example, in the context of a disaster, a businessman may value safety over business development.
- (3) *Multiple values guide action* – The tradeoff among relevant but competing values guides actions and decision-making processes. For example, a community resident may value

both property safety and renovation cost savings. He/she may need to make a tradeoff when deciding whether to install expensive high-impact windows.

Schwartz's Theory of Basic Human Values proposes ten basic human values, including self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence and universalism. These ten values are universal because they are grounded in three universal requirements of human existence, including the needs of individuals as biological organisms, requisites of coordinated social interaction, and survival and welfare needs of groups. These values are classified into two bipolar dimensions with four main categories: self-transcendence, self-enhancement, conservation, and openness to change (Figure 1).

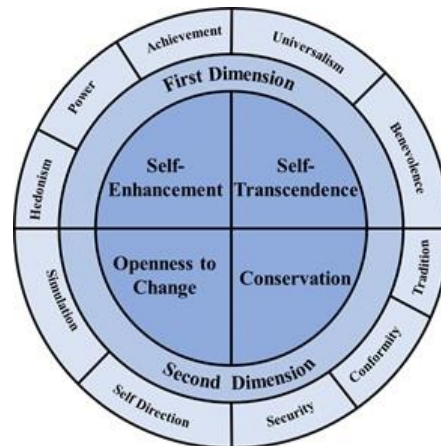


Figure 1. Schwartz's value framework (Schwartz 2012)

The first-dimension contrasts “self-enhancement” and “self-transcendence” values; it captures the conflicts or synergies between: (1) the values that emphasize pursuit of one’s own interests and relative success and dominance over others (power, achievement); and (2) the concerns for the welfare and interests of others (universalism, benevolence). The second-dimension contrasts “openness to change” and “conservation” value. This dimension captures the conflicts or synergies between: (1) the values that emphasize the independence of thoughts, actions, feelings as well as readiness and willingness for change (self-direction, stimulation); and, (2) the values that emphasize protection and preservation of past and current conditions (security, conformity, tradition) (Schwartz 2012).

RESEARCH OBJECTIVES AND QUESTIONS

This study aims to understand and analyze the dynamics of multi-sector stakeholder value systems during the preparedness, response, recovery, and mitigation phases of Hurricane Michael. In this paper, we aim to address the following research question: What do public stakeholders and private stakeholders value in the context of Hurricane Michael?

RESEARCH METHODOLOGY

To answer this question, a set of in-depth, semi-structured interviews were conducted. The interviews were conducted face-to-face during three visits to the Florida Panhandle area in Dec 2018, Jan 2019, and Feb 2019. A total of twenty-four interviews were conducted with thirty interviewees. The interviewees included stakeholders from (1) public agencies and (2) private sector entities. The initial set of interviewees were identified through a review of secondary

sources (e.g., websites of government agencies, local news websites and articles). These interviewees were either individuals who have disaster management responsibilities (e.g., emergency managers) or liabilities (e.g., housing contractors) or were directly or indirectly affected by Hurricane Michael (e.g., local business owners). Each interview lasted for around 20 to 25 minutes.

The interviews followed a semi-structured format, which allowed for modification of questions as per the profession and background of interviewees. For the interview, the questions were classified into five major sections based on the phases of a disaster management cycle: (1) before Hurricane Michael (normal condition); (2) preparedness; (3) response; (4) recovery; and (5) future of the community (mitigation). Under each of these sections, a similar set of open-ended questions were asked. Approximately four to five questions were asked under each section. All the questions were qualitative in nature. For example, stakeholders were asked to explain what their highest priority was during the disaster response phase.

A total of twenty-one interviews were recorded with permissions from the interviewees. For the three interviews in which recording was not permitted by the interviewees, detailed notes were taken. The interview data was transcribed through commercial transcription software, including NVivo Transcription and Sonix.

RESULTS ANALYSIS AND DISCUSSIONS

The result analysis mainly focuses on (1) identifying the main stakeholder values in the context of Hurricane Michael, (2) analyzing the values between public stakeholders and private stakeholders and across different phases of disasters (before disaster, disaster response, disaster recovery, and disaster mitigation).

Classification of Responses

The thirty responses were classified into public and private sectors based on the profession of the interviewees. Table 1 summarizes the types of stakeholders.

Table 1. Stakeholder Information

Type of stakeholders	Examples of interviewees' professions	Number
Public stakeholders	City commissioners, city managers, city planners, emergency management officers, department of transportation officers, chairmen of counties	12
Private stakeholders	Businessmen, doctors, construction project managers, civil engineers, bankers, insurance agents, school principals	18

Stakeholder Value Identification and Analysis

By analyzing the interview data, ten stakeholder values in the context of Hurricane Michael were identified. These identified values were then classified into Schwartz's value framework (Figure 2). A detailed discussion of each of these values were presented in the following paragraphs.

Conservation

In the context of Hurricane Michael, "conservation" includes safety, resource efficiency,

natural resource preservation, and cultural preservation.

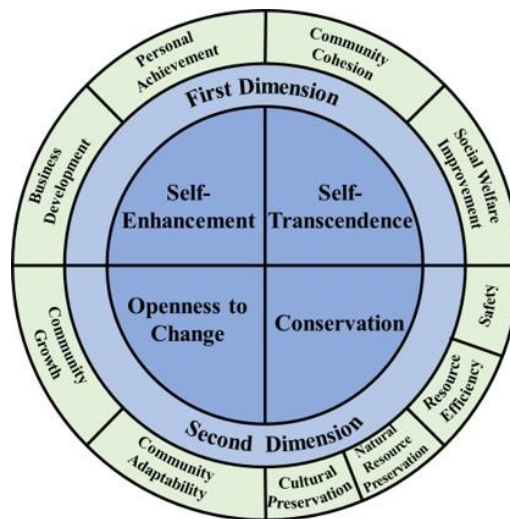


Figure 2. Identified stakeholder values in the context of Hurricane Michael

Safety refers to the condition of being protected from disasters. It was considered as the most prioritized value throughout different phases of Hurricane Michael by both public and private stakeholders. The interviewees from the private sector were mostly concerned about their personal life safety, family safety, employee safety, and personal property safety. For example, as mentioned by one of the interviewees from the tourism business, Hurricane Michael was initially predicted to be a category two hurricane, the local residents' initial value priority was the potential economic impact by Hurricane Michael because 30% of their jobs are tied to tourism. However, as the hurricane approached, "our main value" had "nothing to do with tourism business," one interviewee said, and added: "our main value" was "the safety of our family and friends". On the other hand, public stakeholders attached high importance to the safety of the whole community besides their personal life and property safety. For example, one of the interviewees who works for the city government of Port St. Joe stated that "our aim was to ensure the safety of all residents." To do that, he emphasized that all different sectors need to work more collaboratively to ensure that the communities are aware of the emergency knowledge and resources that are available to them throughout different phases of disasters.

Resource efficiency refers to using all the lifesaving and recovery resources efficiently throughout disasters. These resources include water, food, gas, power, construction materials, and labor, etc. Both the private and public stakeholders emphasized the importance of efficient use of resources, especially during the response and recovery phases. For example, an interviewee from Florida Department of Transportation mentioned that one of the most challenging and prioritized tasks during the disaster response phase was the coordination of the limited resources to effectively clean the debris and open the roads. In the private sector, a major challenge and concern on resource efficiency during the recovery phase is the construction material and labor shortage. The effort to rebuild many of the damaged communities is hampered by a severe labor shortage in the construction industry. As a result, a residential property that used to take three to four months to rebuild now takes six to eight months. An interviewee from Florida Home Builder Association calls for more efforts to provide training on construction to high school students.

Natural resource preservation is the value concerned with protecting, restoring, and

preserving ecosystems (e.g., wetlands, forests, coral reefs), biological resources, geology and hydrology in the context of disasters. Natural resources play an important role in the community's ability to prevent, cope with, and recover from disasters; they help mitigate further damage, encourage economic health, influence property values, and spur revenue from recreational and tourism activities. The importance of natural resource preservation was mostly highlighted by the public stakeholders. For example, one of the interviewees said, "while large-scale disasters like Hurricane Michael cannot be entirely avoided, there are ways we can mitigate the devastating impacts of disasters through better ecosystem management." More strategic planning for green space and vegetated land can reduce the effects of disasters. Vegetated land absorbs water, retains it, and slows its movement, thus helping reduce the flooding and its subsequent effects.

Cultural preservation is the value concerned with preserving and/or protecting the local culture and history. Building more resilient community includes the preservation of historic and cultural resources in the immediate disaster response, long-term community recovery, and future mitigation efforts (NIST 2017). Hurricane Michael seriously damaged and completely destroyed many historical structures in Panama City and Mexico Beach. Both the public and private stakeholders expressed their concerns about the damage to the heritage sites. According to a city commissioner of an impacted community, "we need to preserve and maintain the historic sites of the towns and preserve the landscape of the cities, although it is a challenging process, we need to balance the life safety, economic value, and preservation values in long-term recovery and planning." The key is to retain historic features while sensitively incorporating new features that reduce the risks of future damage from disasters.

Openness to Change

In the context of Hurricane Michael, "openness to change" includes community growth and community adaptability.

Community growth refers to opportunities for growth brought by disasters. Most of the interviewees expressed a positive and optimistic attitude towards the impact of Hurricane Michael, even though their homes, businesses, and infrastructure systems were severely damaged. They highlighted that "[Hurricane Michael] opens doors for growth and change." For example, one of the interviewees who is a city planner mentioned that "the city will grow back, but there is a need to develop and implement stricter building codes." This will ensure that the new communities will be more resilient to such disasters in the future. Another private sector stakeholder from the Panama City Beach mentioned "the city is generally very resilient, and it will always come back strong. Now the goal is to grow back and grow stronger."

Community adaptability refers to the ability of community members to adjust their responses to the changing environments and/or conditions caused by disasters. It is a critical element of community resilience as "community resilience is composed of a set of networked adaptive capacities" (Plough et al. 2013). The adaptability of the communities in Florida Panhandle was tested and challenged by the quick intensification of Hurricane Michael. Local communities were not fully prepared for a hurricane of category five. Meteorologists provided a number of reasons to explain the rapid intensification of Hurricane Michael, one of which being climate change and global warming. The climate-added rapid intensification will make hurricanes increasingly difficult to predict in the future (Chow 2018). Given such a situation, the interviewees from the State Emergency Management Department emphasized that "to build the capacity of community adaptability, we should not just focus on the disaster response phase."

Rather, we need to spend more efforts on disaster mitigation; public education and outreach are the key; training and exercises are the key.”

Self-Transcendence

In the context of Hurricane Michael, “self-transcendence” includes community cohesion and social welfare improvement.

Community cohesion refers to the aspect of togetherness and bonding exhibited by members of a community. It includes features such as a sense of common belonging, trust in neighbors, and/or help and support from the neighbors. During Hurricane Michael, both public and private stakeholders emphasized the importance of community cohesion, and they took actions to help or support each other during the disaster. This result coincides with a number of research studies (e.g., Townshend et al. 2015, Lalone 2012) that confirm social cohesion as a critical component in building resilient communities. Hurricane Michael caused a catastrophic impact on every individual, household, and community in the area. In the immediate aftermath of Hurricane Michael, although federal and state governments quickly announced that the emergency aid had been made available to the affected communities, some of the hardest-hit areas were nearly impossible to reach because the roads were flooded and/or buried with debris. As a result, community residents volunteered to check to ensure the safety of their neighbors after the disaster, shared resources such as water, food, gas, and generators, and helped each other to conduct the initial damage assessment and recovery.

Social welfare improvement refers to providing public or private social services for assisting disadvantaged groups. The regions struck by Hurricane Michael – both the coastal counties under an evacuation order and inland counties people fled to – are among the most socially vulnerable regions in the United States (Direct Relief 2018). It had a huge impact on the vulnerable groups which included poor people, physically disabled, elderly, people who lack transportation access, and who do not understand English, etc. These people are more prone to destruction and they may require additional help and resources to recover. One of the school principals who was interviewed mentioned that his school property was used as a shelter for homeless people during Hurricane Michael. He also emphasized that there was a need to build more emergency shelters for people who are vulnerable to disasters. He believed that incentives and funding provided by the government would facilitate these practices, and there should be more collaboration efforts between the public and private sectors.

Self-Enhancement

In the context of Hurricane Michael, “self-enhancement” is mostly relevant to stakeholder values before the disaster; it includes personal achievement and business development.

Personal achievement refers to personal success by demonstrating competencies according to social standards. Many interviewees mentioned personal achievement as one important value before the disaster. In a disaster setting, different stakeholders have different opinions about the importance of personal achievement. On one hand, several interviewees explained that the priority of safety, resource efficiency, and community growth and cohesion transcended their personal achievements. On the other hand, some interviewees found their value of personal achievement is consistently important throughout different phases of the disaster. For example, a doctor who defines her personal achievement as saving more lives highlighted that her value of personal achievement was still on top of her value list in the context of Hurricane Michael. She reopened her clinic right after the disaster to “save more lives.”

Business development refers to building new opportunities in business and growth in the future. It is a long-term value for many small businesses in the Florida Panhandle area. Due to the impact of Hurricane Michael, many local businesses suffered from severe property structure damage and water, power, phone service outages. Several private stakeholders expressed their concerns for local business development. As one interviewee said, “we were fortunate enough to have generators, so we were able to get power going right away. However, the internet signal and cellular phone signals were not available. It took a month to get back to normal situation after the disaster.” Another interviewee mentioned, “the recovery process will take years.” Although most small businesses purchased the insurance to cover the direct damage (e.g., structure and inventory damage), a considerable number of small companies did not have the small business interruption insurance, which could partially cover the indirect damage such as the loss of customers and revenues due to prolonged closing period.

RECOMMENDATIONS

Based on the results of the interviews, some possible actions to enhance the disaster resilience of the communities at Florida Panhandle areas are as follows:

- Enhance the collaboration between public and private stakeholders: Disaster management is a shared responsibility among all stakeholders. Thus, to build disaster-resilient communities, it is important to integrate the values of both public and private stakeholders. More systematic and formal collaborations between public and private stakeholders should be established in community disaster planning and management. To achieve that, there is a need for consistent and open communications between the public and private sector stakeholders. For example, frequent meetings can be set up mandatorily after a natural disaster such as a hurricane. Frequent communications facilitate collaborations, which would lead to more effective and stakeholder-centered recovery and mitigation practices.
- Prioritize the implementation of disaster management practices based on stakeholder values: Many local communities are still not investing enough on disaster resilience practices, and many decision-makers have not yet prioritized enough support to enhance disaster resilience. Given limited resources, future efforts should be spent on improving disaster resilience based on stakeholder value priorities.

CONCLUSIONS AND FUTURE WORK

This paper presents the preliminary results in identifying stakeholder values in the context of Hurricane Michael. A total of twenty-four interviews were conducted with thirty interviewees from the public and private sectors of the impacted communities. Ten values were identified from the interview data. These values include safety, resource efficiency, natural resource preservation, culture preservation, community growth, community adaptability, community cohesion, social welfare improvement, personal achievement, and business development.

This study contributes to the body of knowledge by offering a more explicit understanding of stakeholder values in a disaster setting. It advances the empirical knowledge in the area of disaster resilience by investigating public and private stakeholders' values across different phases of the disaster. Such knowledge will help practitioners to implement disaster resilience strategies in a way that accounts for stakeholder needs and priorities, thus facilitating human-centered decision making towards building more resilient communities.

This paper summarizes the results based on a limited number of responses in each stakeholder group. This restricts a more detailed analysis and comparison across different stakeholder groups. Larger samples in each group would yield more data from which to work. This issue will be resolved by continuing the data collection with a wider range of interviewees in the future. Other data sources such as social media and news articles will also be explored in the future.

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